

Q.666.05
C
v.28

UNIVERSITY OF ILLINOIS
LIBRARY

Q. Class

Book

Volume

666.05

C

28

REMOTE STORAGE

Je 06-10M

The person charging this material is responsible for its return to the library from which it was withdrawn on or before the **Latest Date** stamped below.

Theft, mutilation, and underlining of books are reasons for disciplinary action and may result in dismissal from the University.

UNIVERSITY OF ILLINOIS LIBRARY AT URBANA-CHAMPAIGN

APR 22 1973

APR 22 1973

JUN 26 1997

L161—O-1096



Digitized by the Internet Archive
in 2019 with funding from
University of Illinois Urbana-Champaign

<https://archive.org/details/clayrecord28unse>

REMOTE STORAGE



Vol. XXVIII. No. 1.

CHICAGO, JANUARY 15, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

PRESIDENT C. A. RAWSON'S ADDRESS TO THE IOWA BRICK AND TILE ASSOCIATION.

You have just been welcomed to our city by our esteemed mayor, Hon. Geo. W. Mattern, and while it is not my intention to take up the time of the convention with any extended speech, it seems fitting that I should add to his welcome a very cordial greeting to our brothers in the trade from every man engaged in the clayworking industry in the city of Des Moines.

In order that you may know how many there are of us so engaged in Des Moines, I will say that we have fourteen working plants here making a diversity of products including paving and building brick, sewer pipe, drain tile, hollow blocks, conduits for electric wires, dry press brick, etc. We have more than 1,200 men directly employed in the clay plants here, and we could count up several hundred more if we should include the number of men employed in mining the coal for our plants and handling the shipping of the finished ware. We hope to have the pleasure of showing you some of these plants in action on Thursday afternoon.

I think it is about five years since this city has had the honor of entertaining this association, and I know there has been some criticism of the attitude of Des Moines towards the convention, but whether or not this criticism has been just we want to say to you that we make you most welcome to our city and that we hope to make this convention the best the association has ever had. We hope to make it so, not by any extravagant entertainment, but by joining heartily with you in all matters concerning the welfare of the association.

As we all know there has never been and probably never will be any semblance of a trust or trust methods in the brick and tile business in this state, the rule always having been every man for himself. Very naturally this condition has produced and is bound to produce some little friction and distrust in our competitors' methods, and it seems to me

the chief office of a convention of this kind is to, as far as possible, do away with such friction and distrust among members.

While we expect to find that the papers that will be presented at this convention will be most interesting and instructive, it has always seemed to me that perhaps the largest benefit in a meeting of this kind is not what we learn from the papers presented but from a free intercourse among the members, the exchange of ideas and the getting acquainted with our neighbors, whom we have always looked upon as our competitors only, and whom in nearly every case we find upon personal acquaintance to be also our friends.

There is an old, old story that I have no doubt most of you have heard, but one that seems to me to illustrate this point, so I will venture to tell it again. As I recall the story it happened in a convention similar to the one we are having to-day, and I take it for granted it happened on the last day of the session. It runs something like this: Two members of the association were sitting in the lobby of the hotel talking together when they were joined by a third member who was a close neighbor and competitor of theirs, and with whom they had had some serious business battles. This third member after talking with them a few minutes excused himself and as he walked away one of the men said to the other, "Blank seems to be a pretty good fellow after all, doesn't he?" and the other replied, "Yes, but do you know that before I met him here at the convention I thought he wore horns."

I know from personal experience that a competitor who is known only through your knowledge of his prices and business methods, such knowledge having usually been gathered by you through hearsay only, and that from interested buyers, is the one we all fear and not the man, who, while he is our competitor, is also our friend through a personal acquaintance. So I say let's get together during the next few days and get acquainted with our competitors. I venture to say that you will find him to be a man like yourself, trying to make the best ware for the least money and trying

to sell it for the best price that you will let him, and trying like yourself to make an honest living for himself and his family.

I believe the brick and tile manufacturers can make no better expenditure of time and money than to visit the plants of the other clay workers. I know from my own experience that I have never yet made such a visit without finding in the other man's plant some idea that I could work over to fit conditions in my own plants and that would make big returns on the time and money I had spent in making the visit.

Our business like every other has its ups and downs, its good and bad years, but it seems to me that we can all look forward to the coming year with confidence. Crops in Iowa are good, business of all kinds is prosperous and if we con-

I find that it is a common error, especially among manufacturers new to the clay industry, to figure their cost price on paper at the beginning of the year rather than from their bank balance at the end of the year. Any one can become rich by sitting down with paper and pencil and figuring how many brick and tile his machine will turn out in an hour, and what he can sell them for, but it will bother him some to find the money at the end of the year. I hope we may none of us figure our cost in that way, but that we may make due allowance for interest on our investment, depreciation, and a just return for our labor and management. If we know what our goods really cost us we are much more apt to get a fair selling price for them.

In this connection I should also like to caution our members against getting scared over market conditions early in



A Group of Clayworkers at the Iowa Brick and Tile Association Meeting.

duct our business in a business-like manner we should be able to find ready sale for our output at a reasonable price.

The new drainage law, now that it has been found constitutional, ought to make a better market for drain tile, not only the larger sizes, but later on the smaller sizes for lateral work. Personally I am not engaged in making any kind of brick, and am not so familiar with the prospects for a good market for that class of ware, but there is one thing that has always struck me about the brick makers and that is their continual lack of prosperity.

There is one subject that I should like to have discussed in this convention, if not on the platform, then on the floor among the members and that is the question of cost price.

the season, and making a low price that will set the standard of prices for the whole season. We have no need to worry because we find ourselves with a few brick and tile on our yards in February and no orders coming in. I venture to say that the same stock will look mighty good to us in April and May when the season's rush opens up.

In closing I want to say a good word for some of the men who have joined with some of the Des Moines clay workers in giving of their time and money to entertain the members of this association. These are the men who are selling to all of us coal, machinery, oil and all kinds of mill furnishings and repairs. I think you will find representatives of all these firms among you, and I am sure you will find they are all good fellows, ready and anxious to give you a square deal on anything in their line.

BRICK VERSUS ASPHALT PAVEMENTS IN IOWA.*

By A. MARSTON, Ames, Ia.

For the last few years one of the violently debated questions of public policy in many of our Iowa municipalities has been brick versus asphalt for paving. In some cases one material has finally be selected, and in other cases the other. Both as brick manufacturers, as taxpayers, and above all as public spirited citizens, the members of this organization are greatly interested in the matter. All of us wish the right decision to be made in each case, no matter which material it favors.

In brick and asphalt we have two very different paving materials, both, however, having most excellent special qualities and both suitable for the construction of most excellent pavements. Together they are largely displacing other paving materials in this state.

Brick first came into use in Iowa about 1889. In 1900 and 1901 a committee of which the writer was chairman, collected data of brick paving in Iowa, which data were published in the form of a sixty-page pamphlet, containing the opinions of the engineers of all towns in Iowa having pavements, on all the principal features of brick pavements. A few copies still remain for distribution.

At the time this bulletin was published there were 4,030,696 square yards of brick paving in Iowa, and only 192,884 square yards of asphalt. That is the asphalt was only about $4\frac{3}{4}$ per cent of the brick.

I do not have at my command figures of the construction of brick pavement in Iowa since 1901, but a statement furnished by the Barber Asphalt Company shows the growth of asphalt paving in Iowa since it was first introduced, in 1896, to have been as follows:

1896—11,861 sq. yds.; 1897—54,612 sq. yds.; 1898—13,188 sq. yds.; 1899—24,041 sq. yds.; 1900—24,547 sq. yds.; 1901—165,399 sq. yds.; 1902—110,728 sq. yds.; 1903—227,603 sq. yds.; 1904—96,030 sq. yds.; 1905—184,000 sq. yds. This gives a total of 896,009 sq. yds. of asphalt paving in Iowa at the present time, as compared with somewhere from 4,000,000 to 5,000,000 sq. yds. of brick.

There have been a few cases of failure in Iowa of both brick and asphalt pavements, mainly in each case among the first pavements built. In the case of brick the main causes of failures were the early use of soft, inferior and uneven brick, such as would now be rejected, or cheap, weak foundations. In the case of asphalt the causes of failure were poor asphalt or poor workmanship, or poor foundations.

For good asphalt pavements the asphalt and other ingredients must be of the best quality, and they must receive the most skillful treatment during construction. In some of the early asphalt pavements in Iowa disastrous experiments were made with new material and with an inferior type of construction. Ottumwa had a disastrous experience along this line and Sioux City has had trouble with one of the early streets. Marshalltown has had trouble with a

recent pavement on one street which the contractors attribute to the use of the old weak macadam foundation of the former pavement. The foundation of an asphalt pavement should attain great strength at an early date, for even before the pavement is put into actual use the foundation must sustain very heavy loads from the steam rollers used in construction. Unless the foundation is strong and unyielding, the asphalt will not receive enough compression during construction.

In spite of the few early failures mentioned, it has been amply demonstrated in Iowa that most excellent pavements can be built with both brick and asphalt. It has not yet been ascertained by the actual wearing out of pavements in Iowa which material will outlast the other, or withstand heavy traffic better. In fact, it is difficult to make a fair comparison as to these points, since the traffic may not be the same on the streets compared, and since the durability depends so much on the quality of the particular brick or asphalt used, on the design of the particular pavement, and on the skill and honesty of its construction.

Starting out, then, with the demonstrated fact that most excellent and durable pavement can be constructed with either material, the question remains, how shall we decide between brick and asphalt in any particular case? To this question no absolutely general answer can be given, for under some conditions brick should be chosen, under others, asphalt. Each material has advantages and disadvantages peculiar to itself.

First, as to *Cost*. Asphalt is in general more expensive than brick. In the case of a first-class brick pavement on a concrete base the difference in price in favor of brick ranges from almost nothing up to thirty cents or more per square yard, averaging probably twenty cents to twenty-five cents per square yard. For a street with pavement thirty feet wide this would amount to about \$4,000 per mile. In the case of a one course brick pavement on a macadam foundation the difference in price averages about fifty cents to fifty-five cents per square yard, or say \$9,000 per mile in favor of brick. These relative prices vary greatly in different places, and it should be noted that in 1905 some very low prices were bid in Iowa for asphalt.

Second, as to *Relative Durability*. We may regard this point as unsettled in Iowa. The advocates of each material claim greater durability. The city engineer of Sioux City, which city has had the longest experience with asphalt in Iowa, thinks brick the more durable. Both pavements are very durable if well made and maintained.

Third, as to *Smoothness and Freedom from Noise*. Here asphalt has the advantage, and it is usually this quality which leads to a preference for asphalt when it is preferred in Iowa.

Fourth, as to *Slipperiness*. Here brick has the advantage and is frequently preferred on steep grades on this account.

Fifth, as to *Cleanliness*. Asphalt can be cleaned more thoroughly, but if not cleaned is injured by moist dirt, which would only protect brick from wear.

Sixth, as to *Sanitary Qualities*. I would make no difference between the two materials.

*Read at the Des Moines meeting of the Iowa Brick and Tile Association.

Seventh, as to *Resistance to Hauling*. Traction tests made under my direction show that there is little difference between the two materials. Brick generally shows a little less traction resistance, especially in summer, since the resistance to hauling on asphalt increases greatly as the temperature rises in summer so as to soften the surface.

Eighth, as to *Maintenance*. The maintenance and repair of brick pavement require only ordinary skill, and can readily be attended to even in small towns. The maintenance and repair of asphalt, on the other hand, require special appliances, and a high degree of skill. No city in Iowa has as yet attempted asphalt repairs itself, such work being done in every case so far by the asphalt contractor. In the case of small towns, repairs are apt to be especially costly and subject to delay on account of the necessity of getting in an outside contractor for a small amount of work. The imperfect cleaning of streets in small towns may injuriously affect asphalt.

Ninth, as to *Encouragement of Home Industries*. Here the advantage is with brick, but even in the case of asphalt most of the money is spent at home.

Tenth, as to *Skill Required in Construction*. The advantage is greatly with brick. Common labor answers in the main for brick pavement construction, though skilled foremen are needed. The apparatus required is simple. In the case of asphalt an expensive plant is needed for preparing and mixing the materials, and the utmost skill and care are required throughout the work. A mistake anywhere may be fatal to success.

Eleventh, as to *Supervision and Tests Required to Secure Good Work*. Here, again, the advantage is all with brick. Any city engineer is prepared to test the brick according to well established methods, and their close inspection as delivered is a simple matter. The other materials, also, are readily passed upon, and every step of the work can be clearly specified and closely inspected and supervised, with the certainty that faithful supervision will produce good results. In the case of asphalt, on the other hand, there is at present not a single testing laboratory for asphalt in Iowa. It is true that the Engineer Experiment Station at Ames proposes to equip for such tests immediately, but even then the processes of testing are more difficult, and not so well standardized as in the case of brick. The methods of construction, also, in the case of asphalt pavement are not well understood by the average engineer, who cannot therefore so supervise the work as certainly to secure good results. Heretofore, therefore, reliance for good results with asphalt has been placed mainly on the contractor's guarantee for a term of years, a guarantee which will be carried out just about as long as the contractor thinks best for his own interests. On the above accounts asphalt pavement construction is mainly in the hands of large companies rather than individual contractors, and there has been little competition.

In this connection we have heard much about undue influence exerted on property owners and councils by the agents of asphalt companies. While I am not one of those who believe that our public officials are in general corrupt, yet it is evident that systematic campaign of argument carried out by an organized asphalt company might very frequently win the day for asphalt, though brick were equally good. Who is there to work as hard for brick? On the other hand, the councilman who by political influence secures the appointment of an incompetent brick paving inspector from his ward, expecting payment in votes, should be considered as corrupt as if he were bribed with money.

So far I have been giving you my own views on the subject of brick versus asphalt, but now I will offer in evidence

the views of men whose opinions must have more weight, viz.: the city engineers of Iowa who have had direct experience with both asphalt and brick paving. It has been my good fortune again to be connected with an investigation of Iowa pavements, in this case with asphalt, as formerly with brick. The results are to be embodied in an asphalt paving bulletin similar to the one already published on brick.

To the city engineers of all cities in Iowa having asphalt pavements, blank forms were sent containing a large number of questions concerning the important features of asphalt paving. One of these questions asked whether asphalt has proven satisfactory, whether it stood heavy traffic as well as brick, and whether the present tendency in that town favored brick or asphalt. The answers received were as follows:

Cedar Rapids.—"Our asphalt is very satisfactory. We have none that is subjected to what would be considered heavy traffic."

Davenport.—Asphalt just constructed.

Des Moines.—"Our asphalt pavements have been very satisfactory and show but little wear. In certain localities here asphalt is favored, and in other localities brick pavement is preferred."

Fairfield.—Just constructed.

Fort Dodge.—"Nearly everyone here is very well pleased with it so far. Stands traffic well. Shows tendency to crack and check up in cold weather."

Indianola.—"We have no other kinds in Indianola. My observations of this paving in other western cities and towns is that asphalt will not stand the traffic that brick will, provided the brick be good, sound, hard burnt, but not over-burnt, and laid on the same foundation that the asphalt is laid and properly cushioned, the brick being easier to maintain as it can be done by the ordinary city force."

Marion.—No report.

Marshalltown.—"Not altogether satisfactory. Some streets stand traffic well, but our Third Avenue, which has heavy traffic, was partly resurfaced in 1905. Present tendency, owing to endless litigation, is against asphalt."

Mason City.—No report.

Ottumwa.—"One asphalt street carries heavy traffic. All the brick and coal for domestic use hauled over it. Brick is generally preferred as many of our grades are steep. Brick wears longer."

Sioux City.—"With the exception of one street, asphalt pavement has proven satisfactory. Do not think it will last as long under any condition as brick. About an equal amount of brick and asphalt has been laid, but think that asphalt will lead in the future, as the greater amount of pavement will be laid in the residence district."

Tipton.—No report.

Waterloo.—"In service as a pavement it has proven very satisfactory, especially on residence streets. Have had no streets laid until 1905 that would give a satisfactory test of the wearing qualities under heavy traffic. Public opinion not prejudiced toward any one pavement."

I feel that I cannot do better than to conclude this paper with these expressions from the men in Iowa whose technical knowledge and daily experience fits them to speak on this subject, while at the same time they have no material interests to give them a partisan bias.

The Hendricks Brick Co., Kingston, N. Y., has been incorporated with \$50,000 capital stock. Incorporators: Clarence P. and Maria V. Hendricks, East Kingston, and Fred P. and Jennie F. Luther, of Kingston.

PAVING BRICK AND PAVEMENTS.*

By W. H. BRECHT, Des Moines, Ia.

Many papers have been written and read on this subject, "Paving Brick and Pavements," by men whose experience and study extend over a long period of years, and when our genial president asked me to present a paper at this convention I objected on the grounds that these various papers—and I take it that most of you have either heard or read them—so thoroughly covered the subject that I had nothing of advantage or interesting to say. With a few suggestions, however, I promised to make the venture. I first want to ask your indulgence for I may, unfortunately, show inexperience or ignorance in the handling of the subject as well as in the attempt to pose as a literary light, instead of an ordinary brickmaker.

Through the National Brick Manufacturers' Association, and more especially through the efforts of the individual manufacturers, the standard of paving brick is nearly all that can be desired. I know from a limited experience, however, that the making of paving brick is a difficult matter, requiring not only the proper raw materials and the proper methods and processes of mixing and burning, but a scientific and practical knowledge of the business in general. The first paving brick laid in this city were necessarily rather poor in quality, but the product has steadily improved until now it can safely be said that our Des Moines paving brick manufacturers produce a brick equal in quality to any produced in this country. It is true and it must be conceded that the manufacturer of paving brick has reached a higher degree of perfection and is conducted with greater skill than any other part connected with the construction of a brick pavement. Brick, as a paving material, has received some criticisms because of the inferior quality of the material which has sometimes been sent out by the manufacturers and there will always be need to exercise care in selecting brick of uniform quality, but I believe that the manufacturers are awake to the situation and that this need will grow less year after year.

Des Moines' first brick pavements were laid, I believe, in 1889, sixteen years ago, and since that time many miles of brick have been laid, the large majority, however, in the early 90's.

These first brick pavements were laid on a foundation consisting of a layer of gravel or sand and a course of brick laid flatwise; during later years it has consisted of six inches of Portland cement concrete and this has been adopted as the necessary foundation. That brick as a paving material has proven successful in Des Moines goes without saying, but it is true that many of the streets, more especially those first paved, are now very much in need of repaving. So far, only two of our streets originally paved with brick have been repaved. One of these, West Grand Avenue, which is our most prominent and beautiful residence street, was paved during the year 1891, for a distance of fourteen blocks, with an inferior quality of hard burned brick. The foundation consisted of a layer of sand and a course of

brick laid flatwise. Unfortunately this pavement was opened from one end to the other, for various purposes, such as telephone conduits, water and gas mains, as well as smaller openings for making extensions from the street to private property. The amount spent for repairs on this pavement was practically nothing and as a result it maintained itself for a period of only a trifle less than thirteen years. It was replaced with sheet asphalt on a five inch concrete foundation during the summer of 1904.

Walnut Street, which is our main business thoroughfare, was paved from the Des Moines River to W. Twelfth Street during the year 1882 with cedar blocks on a sand foundation and replaced during the summer of 1893 with brick on a six-inch concrete foundation. These brick today, right from the kiln, would not be classed as a standard paving brick; they would not compare favorably in any respect with the material now being produced, and it is true that under the heavy traffic they wore off to a considerable extent. This wear, however, was slight compared to the damage as a result of the constant opening of the pavement. I will venture to say that this pavement, twelve blocks in length, was opened in no less than five hundred places, in addition to being opened the full length for the purpose of laying electric light and telephone conduits. You will not feel that this is an exaggerated statement when I say that the ordinance now in force, which requires that before making an opening a permit must be secured from the Board of Public Works, has not been strictly enforced, and any citizen, corporation or contractor has been permitted, upon any sort of a pretext, to make an opening in a pavement without notifying either the Board of Public Works or City Engineer. The replacing of the pavement cut out was in most cases done in a slipshod manner and the result was that the pavement soon became rough and the cry was: "Repave the street." It was repaved during the summer of 1905 with sheet asphalt, an additional three inches of cement concrete being placed upon the old foundation to bring the street to grade. While brick was not chosen as the best material with which to repave this street, it is gratifying to the brick interests of Des Moines to know that with the continued abuse and neglect from the time the brick were first laid in 1893—and it must not be forgotten that those brick were inferior in quality to those now being produced—the pavement maintained itself for a period of twelve years. It remains to be seen whether or not the new pavement will do as well.

In the management of municipal affairs, no one item of expense aggregates more than that of improving and keeping the streets in repair. It is always up for consideration. Cities of medium size are as a rule not extremely wealthy. They have no extra money to spend. Your convention city has had some experience along this line and I believe is up against a proposition at this time. It appears that the fund set aside last spring for street cleaning purposes is almost exhausted and with the larger part of the winter before them there is considerable speculation as to what the appearance of the streets will be in two or three months or when

*Read at the Des Moines Meeting of the Iowa Brick and Tile Association.

the next appropriation is made. This condition prevails not only in Des Moines and is cited to show that the writer believes that the strictest economy must be practiced in the management of municipal affairs as well as in the management of any business concern.

Brick's only real competitor in Iowa is asphalt and when a street is to be paved, as a general rule, petitions are circulated among the property holders by the advocates of both materials.

In a paper on "Paving" read before this association by Mr. John B. McGorrisk of this city at the 1903 convention, the methods employed by the competition in promoting paving and circulating petitions were fully and I believe correctly explained. If the same methods were and could be employed by the advocates of brick, I firmly believe that the minority petitions would be much less. When a petition is presented to a council, whether it be a majority or minority petition, it should first consider carefully the material best adapted for economy and general utility. It must select a material of sufficient strength and durability for the local needs and take careful thought of the first cost as well as the cost of cleaning, and especially the item of repairing, which after the guarantee period expires, falls upon the city. Inasmuch as petitions are not generally circulated by the property holders, but by an agent in the employ of some paving concern, for the benefit of that concern, I do not believe in letting the people, alone, make the selection. Officials are chosen because of their fitness to properly administer the affairs of a city, and I do not believe that the general public are as capable of judging the economy of an improvement as are these officials who devote their time and study to these matters. This would, however, be not only a poor, but a vicious policy in cities where the officials forget that their positions are not to be used for private gain, as is sometimes the case.

As to the first cost of the two pavements it may be estimated that asphalt will be from one-fourth to one-third more and will cost during the remainder of its lifetime perhaps ten or fifteen times as much for repairs as a brick pavement.

A brick pavement, constructed in accordance with the specifications adopted by the National Brick Manufacturers' Association, will last for twenty-five years or longer. If it does not, there is something wrong in the construction. This is the question that is worrying engineers today; not the question of getting good brick, for through the individual efforts of the manufacturers good brick can be secured in most every locality at a reasonable figure.

Brick pavements have sometimes been brought into disrepute on account of the contractor's failure to comply with the specifications. This occurs where contracts are let to irresponsible parties, which is often the case. Our efforts to educate the public as to the best and most economical pavement that can be constructed must not be interfered with, and it might be a good idea for the manufacturers to protect themselves by refusing to sell their brick to contractors who do poor work. We recognize the fact that

the use of our most excellent material has not expanded in the same way as the use of other materials and I believe that the poor work done by some contractors is one of the causes.

I might mention here one bad characteristic of some city officials and that is an inclination to cut the price of brick pavement to the lowest possible figure, and more especially the awarding of contracts to the lowest bidder, whether he be an experienced and reliable contractor or not. It must not be forgotten that the contractor has to pay living wages and he must have a fair profit, and if the price bid is below a reasonable point he will, without regard to the specifications, make good the loss in some other way.

Let me say in conclusion that brick pavements if properly presented will win against all competitors, and if members of this association will be more active in their efforts to educate and agitate for brick roads in the future, than they have been in the past, the demand for brick pavements will be materially increased.

I thank you, gentlemen, for this privilege.

THE PAPERS AND DISCUSSIONS OF THE NATIONAL SAND-LIME BRICK ASSOCIATION.

There seems to be a wrong impression in the minds of Manufacturers of Sand-lime Brick as to the attitude of the Association in reference to publishing the papers and discussions, which were presented at the Convention in Detroit.

It was decided by the Association that, in view of the fact, much money had been spent in accumulating data, in getting professional services and for making experiments, it would not be fair to have this published in the Trade Journals giving the public the benefit. It was, therefore, determined that the proceedings should be printed in full in book form and distributed among the members of the Association only. Therefore, any one who wishes to avail himself of this valuable material can do so by becoming a member of the Association.

The initiation fee is \$5, the annual due is \$5 and for the year 1906 there is an additional assessment of \$30, making the total expense of becoming a member \$40. This is an exceedingly small cost for the amount of information furnished. Several members have already told me that the information they obtained at the meeting showed them where they had been making some serious mistakes and would be a saving to them of at least several thousand dollars. This is the case, no doubt, with a great many members. It would be ridiculous to assume that there are any of us who cannot learn something new that is of value in the manufacture of Sand-lime brick. If we can be working together and help each other out at a small annual cost of \$30 or \$40, it certainly is a mistake for us to try to work out our own problem independently at a much greater cost.

Many manufacturers of Sand-lime brick who have visited me have stated that, if they had had someone to give them the information that they now possess, when they started, they would have been able to save a good deal of money; and instead of merely paying expenses they would have been in a position to pay dividends.

H. O. DUERR, Secretary.

RELATIVE MERITS OF CEMENT AND CLAY PRODUCTS.*

By J. O. REAVER, Des Moines, Ia.

During the last three or four years there has been extensive advertising and exploiting of cement products by cement machinery makers, who have introduced their molds in every town and community where there was a sand bank close at hand and an investor with a few hundred dollars who aspired to be a manufacturer. With devices innumerable on the market the strife has been keen between these machine makers, the advertising widespread, and the tempting tales of riches easily acquired has induced hundreds to go into the business. The field of the brick and tile manufacturer has been especially aimed at by the cement and sand enthusiasts, and the world has been promised a cheaper and "just as good and better" material for building and construction of all kinds than clay. So far the only thing that has been accomplished has been the production of a cheaper material—cheaper in that sense of the term which means inferior quality.

Cement is adapted to many uses, and when intelligently handled and properly combined with other materials probably has no equal for certain classes of construction; but with every Tom, Dick or Harry who never manufactured anything before, mixing it up without knowledge of its properties and with no idea of the results of his experiment, then palming it off on his neighbor as "just as good," it has certainly been one of the biggest bunco games of recent years.

For a time the cement wave threatened to engulf the clay manufacturer, and doom for his carefully built up business was written on every hand—if you believed the claims of the cement promoters. Happily any fears of this sort have been dispelled—and no one has contributed more to this than the maker of cement products himself. Instead of making the best article he could, the competition of the sand man across the way has led him to draw heavily on his own sand bank, and the ever present idea of making as cheap as possible something that is to be cheap in price has made it extremely problematical what a man was getting when he bought cement products.

That any article made from cement and sand and fashioned in the forms made popular by clayworkers can have equal merit with burned clay every one of you will be quick to deny, but the bold assertions and false assumptions of the cement machine promoters that the products of their molds are "just as good or better" need to be corrected if only to maintain our self respect—not counting the service we will be doing our fellows in preventing them from being victimized.

Take cement blocks, for instance, the manufacture of which has been pushed harder than any other form of cement product. Do they compare in any way with the clay product they seek to displace? Are they as good, are they cheaper, are they as strong and durable, can they be utilized for as many different forms of construction and meet as

many requirements in resisting the ravages of time and the elements? The answer to all these questions must be in the negative.

Vitrified clay brick and block are impervious to moisture. The cement block with all its air spaces and double air spaces has not yet been manufactured that will not absorb moisture and retain dampness, and the manufacturers of blocks realizing this fatal defect have sought and are still seeking a cure for it. Some machine makers offer a special recipe or preparation for waterproofing, thus acknowledging that their air-spaced blocks are not what they have pretended to be.

Made with any semblance of honesty they have not been shown to be cheaper than clay. A writer in the current issue of a trade paper devoted to cement interests giving his method of making what he calls good blocks, ends with the statement that if his directions are followed the cost will be no greater than brick or lumber.

As to strength and durability, thousands of years of use attest the lasting qualities of burned clay, and tests of every kind have demonstrated its strength. Cement concrete in the form of building blocks, being of such recent use, has not had the tests that burned clay has been subjected to, but it must be regarded as less durable and less able to withstand the "gnawing tooth of time" when its ability to absorb moisture, the alternate effect of freezing and thawing, expansion and contraction are considered.

The cement block can certainly have no claim for recognition from an artistic standpoint as compared to brick and other forms of clay, with their wide range of design and permanence of natural colorings. Concrete blocks are a failure even as an imitation of stone, a sad substitute for a beautiful material.

The fire-resisting qualities of well-burned clay are too well known to make extended mention necessary. Cement blocks are claimed to be fire proof, but are they? Throwing some light on this question is the report of an insurance inspector of a fire which destroyed a building made of "patent stone" at Geary, Okla., in May, 1904. After stating that the adjoining building, where the fire originated, was made of fairly good brick and stood up for half an hour after the cement building collapsed, he adds: "The patent stone building was constructed of blocks 30 inches long, 10 inches wide, and 9 inches high. Each block has two hollow spaces 4 by 10 inches. Eye witnesses state that as soon as the roof got to burning well, the walls commenced to bulge and the blocks fell apart with reports like pistol shots, one-half of the block going one way and the other half the other. Toward the rear is a portion of the wall about ten feet high on the south side, and the entire rear wall up to the second story was still standing. However, the stone in every block (including those next the ground as well as those higher up) was completely disintegrated. The portion of the wall standing is badly cracked and worthless. Not a drop of water was thrown on this building at any time."

But we don't need to go as far away as Oklahoma, nor is it necessary to have people antagonistic to cement demon-

*Read at the Des Moines Meeting of the Iowa Brick and Tile Association..

strate its unfitness as a fireproof material. The machine men are obliging. They furnish their own illustrations. Last year at the Iowa State Fair a machine maker built a house of blocks, presumably the best he knew how to make, and advertised widely a fire test. Not being present I cannot say how severe the test was, but I have the word of a member of this association, who observed the effects of the fire, and who states that the building was cracked on every side, from top to bottom, some cracks large enough to throw a cat through—with the exception of the front of the building. On the front there were two openings, a door and window, and the only crack was above the door. My friend did not have his camera at the time, but the next morning hurried out to get views of the building, only to find it had been torn down and removed. That same day appeared in the daily papers a half-page advertisement announcing the complete success of the test and a picture showing the front only of the building, the skill of the photographer having eliminated the one crack over the door. This unscrupulous dealing with the truth shows what reliance may be placed in the statements of the machine makers.

I think the indictment against cement block as compared with clay, is complete. Summed up and stated briefly it is charged with not being fireproof or waterproof; with not having proved durability or strength; with not being honest or artistic in construction. It will be found guilty and be condemned as rapidly as the good people become acquainted with it.

The machine manufacturer is still abroad in the land, however, with his get-rich-quick schemes. His latest contribution is a complete sewer pipe outfit, which produces "just as good or better" pipe than that made from clay, and of course so much cheaper that we are put out of business at once. But the machine maker in his frantic chase after the dollars of the gullible, ignores the experience of former adventurers in this line.

There was a spasm of cement sewer pipe making about thirty years ago, and nearly every city of the country felt the effects of it. The experience was a disastrous and expensive one in most places, and the complete failure of the material was chronicled by the engineers of the leading cities of the United States, all of them declaring its unfitness and registering their views as to the superiority of clay pipe. The reasons given for the failure of cement pipe were numerous, but the principal ones were that it had not requisite strength, even though made thicker and heavier than vitrified clay, that it was seldom of uniform texture and that it was subject to disintegration from various causes. Several Iowa railroads about twenty years ago made cement pipe for use as culverts under and alongside their embankments. These cement pipe have been replaced long ago with culverts of clay pipe and other forms of construction, and the railroads are now and have for years past been using thousands of feet of clay pipe for the reason that it is considered more reliable and durable. Cement pipe can undoubtedly be made to stand a fair degree of pressure, but

it takes a good quality of cement and too much of it to make the production profitable to the makers. The same conditions apply to its manufacture as to cement blocks. There is no way of discriminating between the improperly made and the properly made article. The temptation is always to use more sand, and the purchaser will always be at the mercy of the dishonest and ignorant mixer of materials. No chain is stronger than its weakest link, and no line of pipe can be stronger than the weakest piece therein, the caving in of a single piece, which often happened in the former use of these sand pipe, obstructing the whole sewer.

What has happened once it is reasonable to suppose will happen again, and it is not anticipated that cement pipe will become a serious competitor with clay, but we will have with us for some time to come the activity of the machine man and the cement manufacturer to combat, and also have some interesting experiences in setting people on the right road—the clay road.

That the concrete productions have any intrinsic merit comparable with clay, or that in any part of the clay industry the cement imitation is a serious or worthy competitor, I do not believe; but it seems to me that it is the duty of every member of this association to present in his community and to his patrons such arguments as he knows to be true against the use of a material inferior to his own product, and by sending forth from his kilns the very best ware he can produce at as reasonable price as he can with a fair return for his labors, forever set at rest any imputation that there is any material on earth or within it as good for the uses to which it has been put as burned clay.

APPLICATION TO INCORPORATE THE DUKE SUCCESS MACHINE WORKS.

The Duke Success Machinery Company has applied for a charter. The incorporators are F. H. Reid, E. E. Merry, Joseph Townsend, T. L. LeMalta and J. G. Duke. The capital stock is placed at \$50,000 and the corporation will absorb the J. G. Duke Machine Works at Huling and Mulberry streets, Memphis, Tenn.

Frank H. Reid will be president of the new concern, J. G. Duke, vice-president; Ernest B. Merry, treasurer; Thomas L. LeMalta, manager, and Joseph Townsend, secretary.

Mr. Reid is president of the Success Brick and Machinery Company and is also connected with the South Memphis Brick Company, recently organized in this city. Mr. Merry is a mechanical engineer and a member of the firm of Merry Brothers of Augusta, Ga. He is also associated with the South Memphis Brick Company, which concern will use several of his patent devices for the manufacture of brick and the conveyance of same. Messrs. Duke and LeMalta have been associated with the J. G. Duke Machine Works, and Mr. Townsend has for the past sixteen years been associated with the Memphis National Bank.

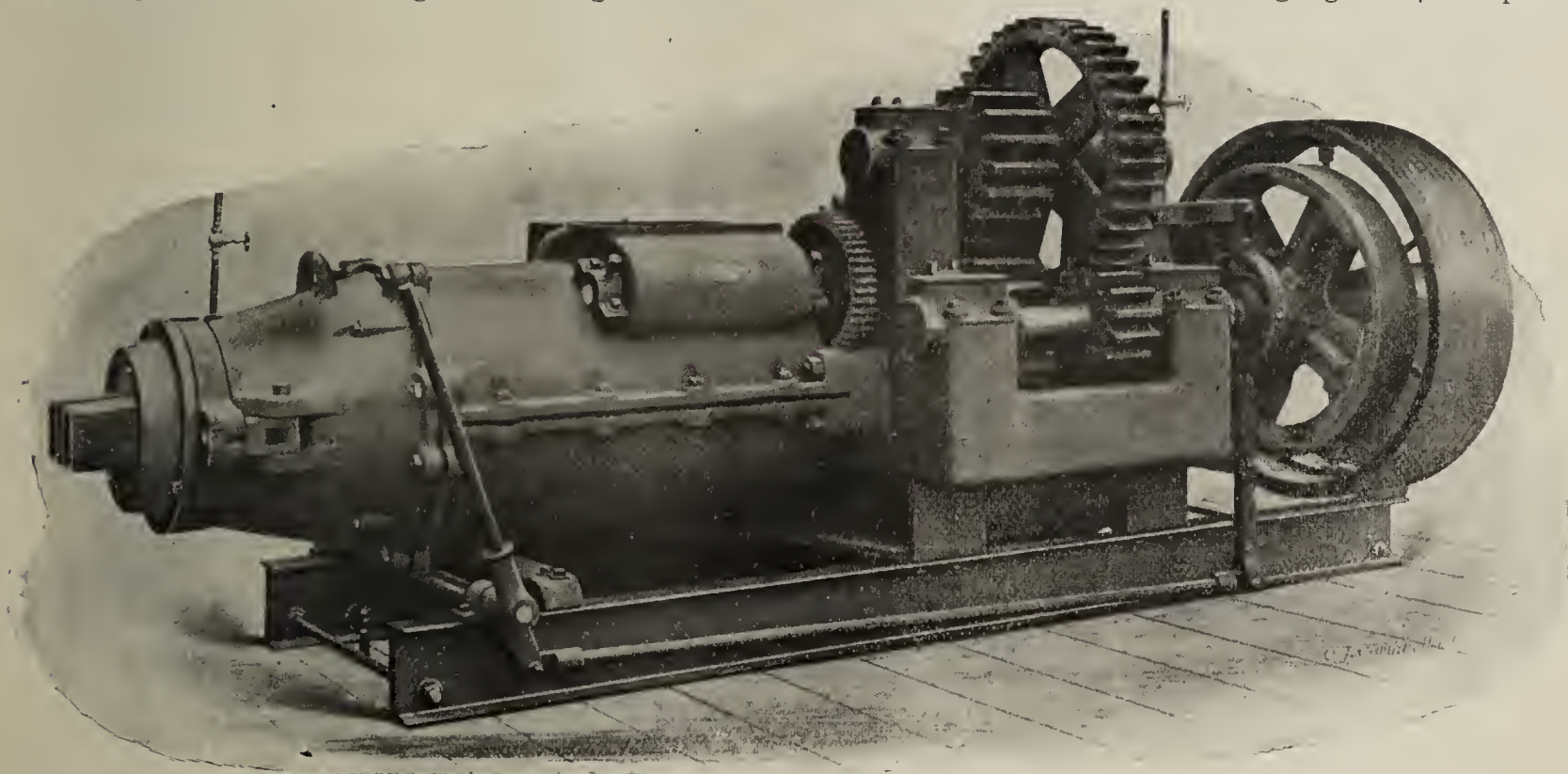
Mr. Merry will later organize a corporation and operate in this city a fiber plaster works.

THE NEW BREWER NO. 25 HORIZONTAL BRICK MACHINE.

That H. Brewer & Co., Tecumseh, Mich., are branching out is again indicated by their new No. 25 Horizontal Brick Machine, which is just now being offered to the trade. Their upright Drain Tile Machines have been well and favorably known for fifty years and they have served as an excellent foundation upon which a prosperous business has been built; but a manifest demand for a horizontal brick machine has prompted the design of this pattern herewith illustrated which is one of three sizes to be placed upon the market as soon as possible.

It is very difficult to give an accurate detailed idea of this machine in the space properly allowable in this journal, but sufficient specifications will be given to bring out the ex-

taking up wear. The operating lever may be placed on iron, closely fitting the liner. Several patterns of screw are provided, but the standard pattern is single pitch throughout its length except the front half turn which is double pitch. The Hinge Front and Safety Latch is so designed that an ordinary machine-bolt, readily procured anywhere, serves as the safeguard against breakage of other parts when foreign substances by accident get into the machine, or when the clay has been given a stiffer temper than desired. The Outboard Bearing is mounted upon the same steel I-beams which connect all other parts making the machine self-contained in every respect. The construction at this point is also such that direct electric motor drive can readily be arranged for without any extra expense or trouble. The Friction Clutch is of high grade 4-arm pattern



The New Brewer No. 25 Horizontal Brick Machine.

cellent points of design and construction claimed by the manufacturers. First of all should be mentioned the great strength and rigidity of the gear frame which is a massive one-piece casting of such shape that spring or vibration is impossible. The gears are heavier than usual for the size and capacity of the machine and the bearings are all self-oiling, a feature which, we are given to understand, is not included in any other pattern. The Back Thrust is self-oiling, self-aligning and adjustable to take up the wear of the screw and is made of white-iron plates ground to a surface. The Puging Cylinder is made up of two pieces machined together and machined to the gear frame and screw case, properly ribbed upon the interior surface. The Puging Shaft is round, 8 inches in diameter, and provides for forged steel knives being mortised into it. The Feed Roll is of such construction that it efficiently prevents bridging of the clay in the hopper and is so incorporated into the machine that it may be easily removed and replaced when worn. The Screw Case Liner is of white-iron properly corrugated upon the interior surface and the screw itself is also white-

with all parts machined together and ample provisions for either or both sides as desired.

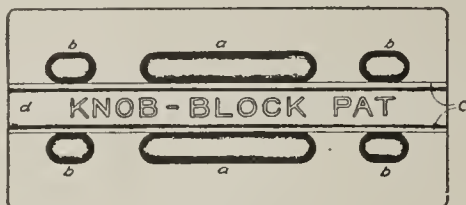
Roughly the specifications of the machine are as follows: Weight, 13000 pounds, Length over all, 12 ft. 6 in. Width over all, 4 ft. 6 in. Height over all, 5 ft. 4 in. Gears, 6 inches and 8 inches face, $2\frac{1}{4}$ and $2\frac{3}{4}$ inches pitch. Journal boxes, 12 inches long, self-oiling. Driving pulley, 42 inches in diameter, 12 inches face. Speed, 275 to 300 revolutions per minute. Capacity under ordinary favorable conditions 5000 standard size bricks per hour.

The American Pottery Supply Co., 616 N. Calvert street, Baltimore, Md., has been incorporated with \$150,000 capital stock by Henry M. Hanna, James C. Gittings, Stuart S. Janney and Albert C. Ritchie.

The W. F. Barnes Commercial Co., 320 Crossley Building, San Francisco, Cal., will build several sand-lime brick plants on the Pacific coast. They operate under the Scientific System.

THE KNOB BLOCK DOUBLE FACED PAVING BRICK.

While in attendance upon the convention of Sand Lime Brick Manufacturers at Detroit, Mich., something new in the line of paving brick was brought to our notice, and inasmuch as all paving brick manufacturers are on the look-out for anything and everything to improve brick paving con-



SIDE VIEW

struction, we are confident that they will be interested in a brief description of this new article.

We visited the local office of the Improved Paving Brick Equipment Co., Wetherbee Bldg. in that city, where, among other places the new paving brick was on exhibition. The Calder Brick & Coal Company's plant at Cameron, Pa., are

tained. The small lugs near the ends of the block fall on the longer lug in the center of the adjacent block, thereby preventing this longer lug from holding up the filler. The depressed letters, together with the grooves in the central panel, provide a perfect key, holding the block firmly in place. The height of the lugs regulated the size of the filler space, so that either a larger or smaller space may be secured at will; i.e., if the lugs are made 1-16" high then the space between the blocks will be 1/8"; or if the lugs are made 1/8" high, then the filler space will be 1/4". Any desired width of filler space may thus be secured by the use of this block. It is impossible to lay the block so that the filler space is destroyed, for they may be layed either face to, and either edge up. This advantage not only assures the bond made by the filler being continuous and even, but also greatly saves time in laying the pavement, and in handling.

The shape of the lugs makes breakage of this impossible in handling. The alignment is also perfectly assured, even where bats are used. All these features of the "Knob-Block" are certainly of great value to all interested in the success of brick pavements.

SECTION OF PAVEMENT

NOTE:- UNIFORM FILLER SPACE



manufacturing the "Knob-Block" paver in large quantities, and it is to this paver we desire to call the attention of our readers, in the belief that their interests and that of improved paving will be served thereby.

Mr. Alvin F. Knobloch devised and patented this new design of paver, which bears his name, "Knob-Block." It was first manufactured by the Calder Co., but the demand for it has outgrown the capacity for any one plant to meet, and it is to be made in many other plants all over the country in the near future. Its principal and most novel feature is that it is a "double faced" block, i.e., it has lugs or knobs on both faces, in place of but one face, as is the case with all other paving blocks: the object being to provide a continuous and even filler space between the blocks throughout the entire pavement. The "Knob-Block" certainly does provide such an even and continuous filler space, thereby making a perfect bond possible, an absolute essential in a good pavement. The lugs are so arranged, shaped and based on the block, that no matter where the joint is broken, lug always contacts with lug, and so the required filler space is main-

One of the prominent city engineers in Detroit says of this paver that, "It is a long step toward the perfection of brick pavements." All practical men who have seen it are unanimous in their approval of the "Knob-Block," and we ourselves cannot help but agree with them that it is an important advance over anything yet produced for the purpose,

NOTE-UNIFORM FILLER SPACE



END VIEW

and worthy of the most careful consideration of all paving brick makers. The present Commissioner of Public Works of Detroit, J. J. Hauer, speaks of it in the highest terms. He says:

"I have seen the 'Knob-Block' double faced paver which you submitted, and it appeals to me as the best constructed

paving brick I know of. I shall recommend that the brick to be made by our municipal plant be constructed after this model, with lugs on both sides as covered by that patent; and shall make recommendation that all our machinery be equipped to turn out the same style of brick, covering the same points of advantage, to include lugs on both faces of the block. This is the only construction of block that assures a continuous and even filler space throughout the pavement. I shall recommend to the manufacturers whose brick we use that they construct a double faced paver after this pattern, or one equally as good, in making brick to be used in Detroit pavements.

"I believe the 'Knob-Block' solves a problem in brick paving, and with our City Engineer, R. H. McCormick, agree that this construction is a decided advance toward perfection in brick paving."

Three questions will naturally arise in the minds of manufacturers reading this article, viz.: "How is this new brick made?" "What will it cost for extra machinery to make it?" "Can any repress now in use, be used for its manufacture?"

In reply to these questions, it may be said that this double faced paver can be made on any repress, the principal thing required being a special set of die plates. The lugs are so shaped that they deliver readily from the lower die plate of the repress. In the drier and kiln they are handled as the ordinary paving brick is. It will be seen from this that the expense for the change required to manufacture the "Knob-Block" is very small.

Where desired, Wm. D. Southwick, Bus. Mgr. of Improved Paving Brick Co., will make it possible for all who wish to make a double faced paver at their plant to do so under this patent, which covers all double faced construction, raised letters, lugs, etc. It is quite probable that this double faced paver will be on exhibition at the exhibit hall at the meeting of the National Association at Philadelphia.

FOOTPADS SLUG AND ROB PAYMASTER OF CONCERN.

After having deposited \$7,000 in a safe in the Hydraulic Press Brick Company's office, at St. Louis, Mo., Henry P. Ashmeyer, paymaster, started for home and was accosted by two highwaymen a short distance from the plant, King's highway and the Frisco railroad tracks.

The thieves, who were masked, beat him because he declared he had no money, and after searching him departed with his pocketbook, which contained a small sum, and his gold watch and chain.

It was pay day at the plant, and it is presumed that the robbers believed Ashmeyer would have the salaries of many employes who did not call for their pay.

He fought his adversaries valiantly, but was overpowered. His belongings were taken from him by one of the robbers while the other held him prostrate on the ground. He suffered several scalp wounds in the fight.

Ashmeyer lives at 3428 Vista avenue. The robbery took place at King's highway and the Frisco railroad tracks.

THE GIANT CAR MOVER.

The M. Mitshkun Co. of Detroit, Mich., has placed upon the market a car mover (adjustment can be found on another page) which should find ready recognition among our readers.

To shippers or receivers of goods in car load lots, the necessity for employing car movers is many times emphasized. In switching cars, the engineman engaged in that duty is not invariably careful as to locality, but even when he is, the occasion to move the car to a more convenient place frequently arises, and these are the times when car movers are brought into requisition. The moving of a loaded car requires a number of men, entailing expense, but, by the use of a "Giant Car Mover," one man can move any loaded car, even up grade, because the sliding wedge blocks the car and holds what the lever gains.



The Giant Car Mover is sold direct from the manufacturers to you (no middlemen profit to pay) at the low price of \$3.00 each, which is only a fraction over cost of manufacturing, with a guarantee that any malleable part broken within six months from date of invoice will be replaced free.

Over 11,000 movers were shipped during 1905 and they have thousands of unsolicited testimonials, showing what a convenient tool they are around cars.

Write for their monthly publication, "The Railway Equipper," describing fully their railway specialties.

ALSO A BY-PRODUCT THAT YIELDS BRICKS AND PAVING BLOCKS.

A plant was recently erected at Zurich, Switzerland, for disposing of the city garbage by burning, the heat engendered being utilized to manufacture electricity. The plant is located in the outskirts and contains twelve furnaces, which are capable of burning 125 tons of garbage in twenty-four hours. The wagons loaded with garbage are lifted by means of a derrick upon a platform above the furnace into which the garbage is dumped. As garbage, however, does not burn easily, an electric blower injects a strong current of air which has been heated by passing through flues in the furnace walls.

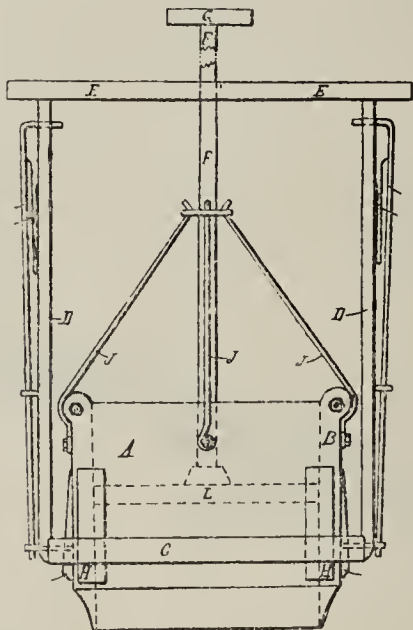
The heat engendered is sufficient to make steam, which is used in the usual way to operate the dynamo. The electric power produced is used first for the purpose of the plant and to supply part of the power of the electric railroads of the city. Complete combustion of the garbage does not take place. From 30 to 40 per cent of its original weight remains in the form of slag. This slag, by mixing with lime, is used for making bricks and paving blocks.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURERS.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

804,890. Mold for the Manufacture of Cement Brick. William A. Shock, Huntington, Ind. Filed Apr. 29, 1905.

Claim.—A combination in a machine or mold for the manufacture of cement brick, of end and side plates attached

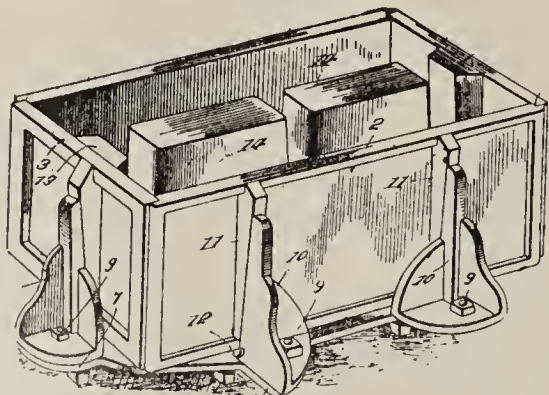


together at the upper margin thereof by detachable bolts or screws, with wedge-like projections on side and end plates, with removable loop pressing against wedge-like projections forcing side and end plates into position when pressed downward, with tamper-plate fitting into mold from above, with springs attached to side and end plates throwing lower edge of side and end plates outward when released by raising loop, all substantially as set forth.

805,242. Fireproof Quartz Brick or Block. Ernst Stoffler, Zurich, Switzerland. Filed May 11, 1904. Serial No. 207,479.

Claim.—The herein-described process of making fireproof brick, which consists in mixing sand or its equivalent with magnesia alone as a binding material, molding the bricks, then hardening them with steam and then burning the hardened bricks.

805,418. Mold. Robert T. Frost, Dows, Iowa. Filed Feb. 15, 1905. Serial No. 245,725.

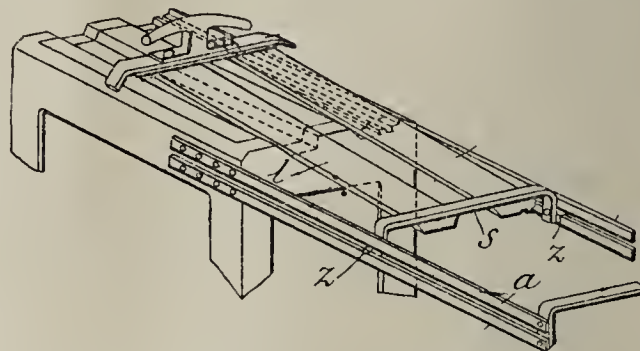


Claim.—In a mold, the combination of a base, a plurality of independent standards extending upwardly from the base, a mold-box composed of separate sides and ends to be held together by the standards, the cams 11 carried by the sides and ends to engage the standards, and the lugs 12 projected from the sides for co-operation with the standards to facil-

itate positioning of the cams 11 with reference to said standards.

804,944. Cement-Roofing-Tile-Making Machine. Alfred Gaspary, Markranstadt, near Leipsic, Germany. Filed Feb. 3, 1905. Serial No. 244,030.

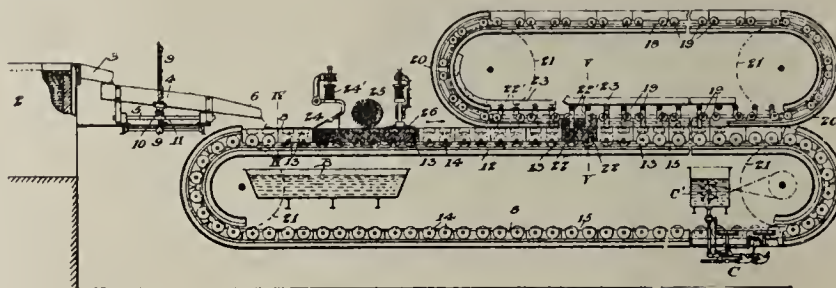
Claim.—In a beating and stamping press for making roofing-tiles or artificial stones in which the material is beaten or pressed upon a beating table or mold, a beating-



iron consisting of a narrow plate provided with a handle and having the contour of the tile to be formed, longitudinal fillets or bars also shaped to the contour of the tile and connected with the plate at one end, a cross-bar fixed to the opposite end of the fillets and a pair of guides fixed to the table and adapted to guide the cross-bar and with it the beating-iron substantially as described.

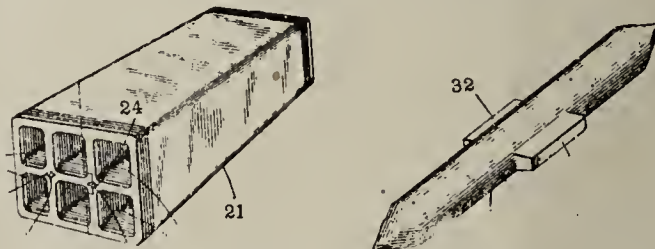
805,702. Apparatus for Producing Vitrified Bricks, Tiles and Other Articles. Ralph Baggaley, Pittsburg, Pa.

Claim.—Apparatus for the manufacture of vitrified articles from slag, comprising molds means for feeding molten slag thereto, gravity-retained covers for said molds, and movable pieces adapted to press upon a portion of the slag in the molds and to shape the same; substantially as described.



Apparatus for the manufacture of vitrified articles from slag, comprising molds adapted to receive molten slag, means for moving the molds in a series for a sufficiently long period of time to permit setting of the articles, and an annealing-chamber into which the articles are discharged, said annealing-chamber having a sloping bottom and an opening for the discharge of the annealed articles; substantially as described.

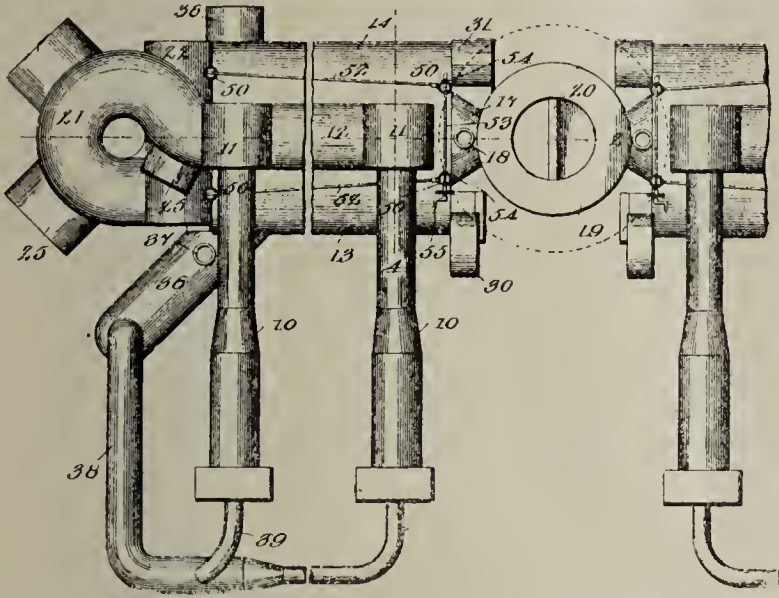
805,665. Conduit. Daniel E. Reagan, Terre Haute, Ind. Filed March 10, 1905. Serial No. 249,362.



Claim.—The combination of conduit-sections having longitudinal openings for the reception of the devices to be carried thereby and also smaller longitudinal perforations

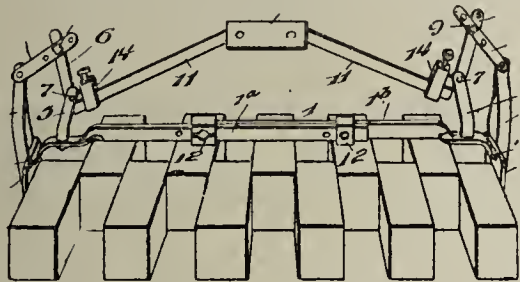
parallel therewith for the reception of dowel-pins, said last-named perforations having wing-like recesses extending laterally therefrom, and dowel-pins the ends whereof are adapted to extend into the corresponding perforations in adjacent ends of the conduit-sections and the wings whereon are adapted to enter and be received by said wing-like recesses, all substantially as shown and described.

805,953. Cement-burning Kiln. Guy D. Helmick, Fort Russell, Wyo. Filed March 27, 1905. Serial No. 252,295.



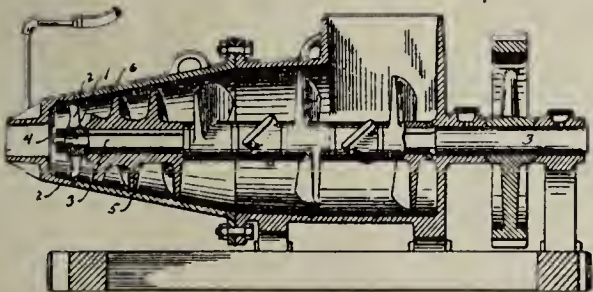
Claim.—The combination with a burning-furnace, of a regenerator located below said furnace, a spirally-descending flue communicating between said furnace and said regenerator and provided with an aperture in its peripheral surface, a dust-collecting box adjacent said aperture, and flue connections between said regenerator and said furnace for introducing the returned heated air to the material being treated.

806,672. Brick-grapple. Samuel Hunziker, Sutton, Neb. Filed March 24, 1905. Serial No. 251,844.



Claim.—In a brick-grapple, the combination of an expandable bar, jaws pivoted to the ends of the bars, arms projecting upwardly from the jaws, standards projecting upwardly from the bar near the end portions thereof, levers pivoted to the standards, links connecting the levers with the arms of the jaws, a handle, and link-bars adjustably connecting the levers with the handle.

806,312. Brick-machine Attachment. James G. Barbour, Canton, Ohio, assignor to the Metropolitan Brick Company, Canton, Ohio, a Corporation. Filed March 6, 1905.

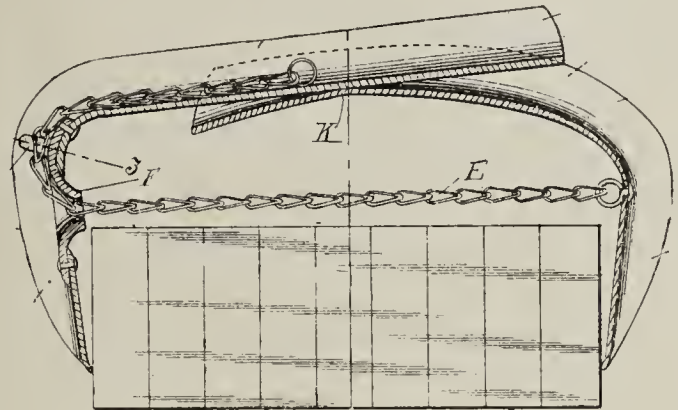


Claim.—In a brick-machine attachment for the purpose described, the combination of a casing and die, a shaft ro-

tatable within the casing, and an auger mounted upon said shaft, a hub provided with radial bars, said hub loosely mounted upon the auger-shaft and located intermediate the forward end of the auger and at the rear of the die, substantially as and for the purpose specified.

806,197. Brick-tongs. Fritz Schulz, Chicago, Ill., assignor to the Good Manufacturing Co., Chicago, Ill., a Corporation of Illinois. Filed Apr. 10, 1905. Serial No. 254,728.

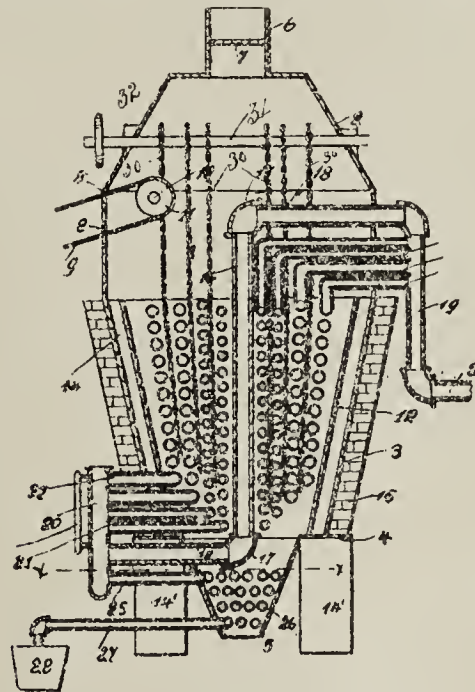
Claim.—A lifting-tongs comprising two L-shaped jaw members movable telescopically relatively to each other, a chain or the like secured to the jaw portion of one member and adapted to engage locking means on the other thereof to hold said members against relative movement in one



direction and serve as fulcrums upon which said jaw portions turn, the interfitting portions of said members forming stems for actuating said jaw portions to turn the same, and one of said stem portions being provided between its ends with a fulcrum upon which the other stem turns.

806,530. Sand-drier. Clark J. Duncan, Windber, Pa. Filed Sept. 6, 1905. Serial No. 277,200.

Claim.—In an oven of the character described, the combination with a suitable conveyer, of a casing, said casing



having a bottom of substantially frustrated conical shape and top, infusible material surrounding the bottom of said casing, an inner shell mounted in the bottom of said casing, coils of tubing supported within said inner shell, said coils having common stand-pipes, one of said stand-pipes communicating with a suitable supply of steam, a tapering spout carried by the bottom of said casing, tubing supported within said spout, a water-trap, and pipes establishing communication between one of said stand-pipes, said tubing and said water-trap, substantially as described.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII.

JANUARY 15, 1906.

No. 1

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

CONVENTIONS.

The twenty-eighth annual meeting of the Illinois Clay Workers' Association will be held at Champaign, January 23, 24, 25th. Headquarters at the Beardsley.

The sixth annual meeting of the Wisconsin Clay Workers' Association will be held at Menominee, date not set.

The Eighth Annual Meeting of the American Ceramic Society will be held in Philadelphia, Pa., February 5-6-7, 1906. Headquarters at the Continental Hotel.

The Twentieth Annual Meeting of the National Brick Manufacturers' Association will be held in Philadelphia, Pa., February 7-8-9, 1906 (date of meeting).

An ungrateful man is the meanest thing that crawls.

A coward is a man who knows he is wrong but refuses to admit it.

CLAY RECORD—semi-monthly—one dollar for a whole year. Try it.

Your ship will never come in unless you go out with a tug and meet it.

While it doesn't take any more time to be polite than disagreeable, the latter seems much easier to some people.

Wise is the man who knows himself thoroughly and does not try to find out things about his competitors.

The time of the meeting of the Illinois Clay Workers Association to be held in Champaign, Ill., Jan. 23, 24 and 25, is rapidly drawing near and soon will be upon us. Everything promises an unusual attendance, and one of, if not, the most interesting conventions ever held.

The program is an exceedingly comprehensive one, dealing with almost every subject of interest to the progressive and the up-to-date clay worker; and from the nature of the subjects and those who will present them the discussions will be lively and entertaining as well as profitable.

There is every inducement to the man in the business to attend the convention, and he who misses it will certainly regret he did so, when he subsequently learns from other sources, after the convention, of the good things he missed.

These annuals are no longer what they used to be in the years gone by—occasions for hilarious times—but have become the one and only opportunity occurring each year when men engaged in the same line of business may compare notes, exchange ideas, detect errors of their own in the experiences of others, or learn from others their mistakes and avoiding making in the future the same mistakes themselves.

"A word to the wise is sufficient." So we say, don't forget the dates of meeting, *and be there.*

More than once in these columns have we had something to say on the subject which is the point of this editorial.

Increased experience, wider observation thus far have failed to reveal the motive of the members of Boards of Public Works which prompts them to ignore home production, in the way of clay products, and place the contracts for the material elsewhere when at home as good, if not better, material could be obtained.

Of course in these days when it would seem that there is but one thing which influences and controls, viz., graft, that possibly the explanation lies there, but we are weary of looking to "graft" as the explanation of everything which is irregular and objectionable and against the interests of industries in communities, and whether we can explain or solve the problem on some other ground is a matter yet to be determined.

There are many people so constituted they can see nothing good in their own locality; this fact was noted long ago by one who is reported to have said that "a prophet is not without honor save in his own country," and people of this

peculiarity, strange to say, by some hook or crook get into public stations and when supplies are required they look to and secure them from outlying districts, ignoring everything the home market offered which, in the majority of cases, was equal to if not superior in quality and lower in price than that imported.

It seems to us that in localities where such state of things exists there should be a mighty effort on the part of those affected (and not only these but public spirited men generally) to arouse public sentiment to such a pitch so as to make it impossible or next to impossible for such things to happen as buying from foreign markets materials which may be had in the local markets.

We noted a case in Denver, Colorado, recently where a quality of brick could have been bought, as a large quantity was made up in the full expectation of selling it, of quality equal to and price lower than the outside product, but the Board of Public Works flatly refused to buy the material, and, without even condescending to make a test which it was invited to do, went to a neighboring state and bought. Now if the material was not up to the standard, or if it were, and price obtainable elsewhere could not be met that would put the "shoe on the other foot" and change the question decidedly, but quality could have been equaled and price made lower, still the local concern did not get the business. In our opinion, public opinion and suitable regulations of the Boards should make this kind of injustice impossible, and we hope the brickmakers generally will bring about this state of things in the not distant future.

WOMAN HELD TO BE NO WIDOW OF L. J. HOWARD.

St. Louis, Mo., Jan. 13.—Probate Judge Crews today rendered a decision in the Leafgreen-Howard will contest to the effect that Mrs. Mary Almeda Leafgreen has no legal title to any portion of the \$500,000 estate of Laclede J. Howard, wealthy fire brick manufacturer, who died intestate April 4, 1903. Mrs. Leafgreen sued for a widow's share of the estate, claiming that she married Howard at Decatur, Ill., in 1883 and that he was then known as Charley Howard, a cigar-maker.

Mrs. Leafgreen's suit was filed May 12, 1905, but did not come to trial until December last. About two weeks were occupied in the trial and more than sixty witnesses were examined. Evidence was introduced to show that the Howard married to Mrs. Leafgreen was Thomas Jefferson Miller, now mayor of Turnwater, Wash., and his deposition was read to this effect. Counsel for Mrs. Leafgreen said after the decision that the case would be appealed to the circuit court.

ACCIDENTS, DAMAGES AND LOSSES.

Wm. Buchholz has begun action against the Wooster (O.) Shale Brick & Clay Co. to recover on two notes given by W. C. Yost as president of the company.

R. C. McLean, of the West & McLean Brick Co., Alleghany, Pa., says the company is not a bankrupt and claims that his partners deceived him.

Ole Rudd, a Norwegian employed at the plant of the United States Brick Corporation, Michigan City, Ind., was badly scalded about the face by coming in contact with a rush of steam from the boiler.

Adam Lynn, an employe of the new brick and tile plant at Fairfield, Ia., fell 20 feet and was badly hurt. He is still alive, but helpless.

A petition asking that the Laurel (Md.) Clay Products Co. be declared bankrupt has been filed in the district supreme court by several of the officers of the company.

The Great Western Railroad Co. has brought suit against the Lehigh (Ia.) Clay Works for the recovery of money withheld by fraudulently misrepresented weights.

The Manitowoc (Wis.) Clay Co. has filed notice of an appeal from the award of \$7,500 made by the appraisers for the C. & N. W. Ry. cutting through their property.

The supreme court confirmed the sale of the property of the Great Northern Clay Co., Ballard, Wash. The original application was brought by Robert Nesbitt and upon his application J. E. Ballou was appointed receiver. After several months he resigned and A. L. Brown was appointed.

William Halls, Jr., of New York, bought in the plant of the Ferguson Brick Co., Troy, N. Y., for the mortgage plus \$500.

While lighting a fire in the kiln of the Enterprise Brick Co., St. Louis, Mo., Mark Fisher caught fire and was burned so that he died a few hours later.

FIRE! FIRE!! FIRE!!!

The entire plant of the Natchez (Miss.) Brick Mfg. Company was lost by fire. Loss, \$20,000. No insurance. Origin unknown.

The Dickinson (N. Dak.) Fire Brick & Pressed Brick Co.'s machinery building was completely destroyed by fire, causing a loss of \$2,000. No insurance.

The dry kilns of the Arkansas Brick and Mfg. Co., at Little Rock, were destroyed by fire, causing a loss of \$3,000.

The office of the Olive Hill (Ky.) Fire Brick Company burned and caused a loss of \$10,000.

The brick plant of Ingram & Co., one mile south of New Brighton, Pa., was badly damaged by fire. The loss will be \$6,000, with \$2,000 insurance. Robt. R. Ingram of Alleghany, is the principal owner. The plant will be rebuilt at once.

Mrs. L. B. Kerwood, Ballard, Wash., is trying to establish a pottery in that city.

TIES MADE OF CLAY.

Since the concrete tie has demonstrated its durability under conditions of severe traffic inventors are coming forward with numerous other substitutes for the oak tie, which, it is universally admitted, is becoming seriously scarce.

The latest claimant for honor in this field is an Indiana man, who proposes a vitrified clay tie made in two pieces, connected by a steel rod. The blocks are made preferably about 30 inches in length, eight inches in width and six and a half inches thick. Recesses are provided in the top of the block to receive the steel bolts, which engaged with the rail, and which are to be secured in place by grouting with lead, sulphur or some similar binding material, which would be poured into the receptacles.

It is asserted that such a tie can be manufactured for less than the present cost of an oak tie.

THE RAILROAD COMPANY WILL WORK UP THE INDUSTRY.

The Frisco railroad company is taking up the clay industry along its lines and is devoting a great deal of time to the development of the industry. They realize that the industry is not only growing rapidly, but the center of the industry is moving west. The Brazil field, the largest of them all, was responsible for the change of base and the interest that now centers around the industry. The Frisco people have had a number of clay experts here lately looking into our resources, and express themselves as both surprised and pleased with the outlook. They all agree that the character of the clays and shales here are superior to that of any other field, which means that they will devote a large proportion of their efforts to this field. There are other clay fields along their lines, but that of this section is by a long shot the best of them all. When the Frisco attempts anything it is done thoroughly, and we expect to profit handsomely by their interest in the industry.

GAS BELT ASSOCIATION OF BRICK PLANTS HOLD ANNUAL MEETING.

The brick plants of the Kansas gas belt, organized into association, held its annual meeting at Independence, Kansas, the 6th, and besides the routing of business elected, or rather re-elected, the following officers:

President—J. J. Amos, Humboldt.

Vice-President—R. Nesch, Pittsburg.

Secretary—E. R. Dick, Coffeyville.

Treasurer—A. W. Shultis, Independence.

Executive Committee—J. J. Amos, E. R. Dick, E. R. Dickinson, Cherryvale; B. E. La Dow, Fredonia; A. C. Stitch, Independence; F. E. Schumard, Cherryvale.

It was recommended that the common brick henceforth be made the following uniform size: $2\frac{1}{4} \times 3\frac{7}{8} \times 8\frac{1}{4}$.

The association is now composed as originally of 26 plants.

As regards the proposed merger of all the brick plants of the gas belt, we are informed that the option on these plants has been extended from January 1, 1906, to March 31, 1906.

HEAVY REFRACTORY BRICK ORDERS.

The Harbison-Walker Refractories Company, Pittsburgh, Pa., reports the demand for its products as very large and constantly increasing. Some of the larger contracts on which it is now shipping or which it has recently completed are as follows: Blast furnaces and stoves: Brick for complete lining for pipe connections, boiler settings, etc., one blast furnace and four stoves, Midland, Pa.; for two blast furnaces and eight stoves, Youngstown, Ohio; for one blast furnace and four stoves, Chicago, Ill.; for three complete furnace linings, Sydney, Nova Scotia; for two complete furnace linings each to Bethlehem, Pa., and Buffalo, N. Y.; for one complete furnace lining, Wharton, N. J.; Detroit, Mich.; Canal Dover, Ohio; Sharpsville, Pa., and Harrisburg, Pa., and for complete linings for nine stoves to an Eastern iron company. These orders call for approximately 17,125,000 brick. Beehive Coke Ovens: 1,700,000 brick for the Territory of New Mexico, 1,000,000 for the Connellsville Basin Coal & Coke Company, 700,000 for the West Virginia Coal & Coke Company, 200,000 for the Perry Coke Company, and 1,000,000 for the Washington Coal & Coke Company. By-product Coke Ovens: 2,500,000 brick for the Harrisburg district. Many orders have been received from cement manufacturers, including one for complete linings for 15 rotary kilns for Kansas and Texas.

The company is also experiencing an exceedingly large demand for silica brick for open hearth steel furnaces, glass furnaces, copper furnaces, etc., and for magnesite and chrome brick from open hearth steel works, copper works, etc., and also a large run of carload orders from regular consumers for all classes of refractory materials. As contracts for refractory material are usually placed considerably in advance of the date of completion of plants the Harbison-Walker Refractories Company is in a favorable position to judge of the possibilities and prospects for the future. The very large demand for such material is considered an excellent indication of an active state of business for some time to come.

MR. MICHEL CHANGES HIS BASE.

Mr. A. Eugene Michel is now with the Geo. H. Gibson Co., Advertising Engineers, Park Row Bldg., New York City, having resigned at Assistant Advertising Manager of the Standard Paint Co. Mr. Michel is a graduate of Rose Polytechnic Institute and his professional experience includes: two years in the Engineering Department of the Diamond Chain Works of the Federal Manufacturing Co., charge of the Testing Department of the Ewart Mfg. Co., and the Assistant Managership of the Department of Publicity of the International Steam Pump Co. under Mr. Gibson. The Geo. H. Gibson Co. writes and conducts the advertising of a number of engineering concerns, but is not an advertising agency in the usual sense of the term, that is, it does not deal in advertising space or material, nor does it receive commissions from the papers. With the accession of Mr. Michel its staff of writers now includes three engineers who have had extensive practical experience in civil, mechanical, electrical and mining engineering and engineering journalism.

HUDSON RIVER BRICKMAKERS MAKE EARLY RENTALS WITH GREAT EAGERNESS.

Never before in the history of the brick business has such keen anxiety and eagerness to secure brickmaking plants by those identified with the business been witnessed as is now in evidence. Notwithstanding that the conditions which have prevailed for the past two years, the spirit of harmony existing between all departments of the trades, iron workers, etc., seem to be giving away to a feeling of dissatisfaction, at least that is becoming quite strained over the action of the Housesmiths' Union in New York city, the brickmakers give no thought to anything but pleasant conditions. Not a man identified with the trade can see anything except the most glorious prospects for the next few years, and visions of a lifetime's competence is so fascinating as to be irresistible. Consequently there is a rush to secure brickmaking plants unparalleled in the history of the trade.

During the last few weeks many changes are being announced. It is from three to six months ahead of the regular brickyard renting season, and this shows conclusively the desire to get in the business. As a result, some anecdotes are creeping out.

Something about five years ago when Reilly and Nicholson occupied one of the Eckerson yards, at Haverstraw, they were very tardy in making their lease, and as the brick-making season was then about to open, they were rather surprised when William Levy and his partner, John O'Brien, slid in underneath them and made a five-year lease, cutting them off one of the Nicholson yards. Mr. Nicholson is now reported to have turned the tables and has rented from the Eckersons the yard recently operated by Levy & O'Brien, shutting them out entirely. There is a report in circulation that Messrs. Levy & O'Brien have secured the option or lease of a piece of property in the vicinity of Saugerties.

The DeNoyelles are to operate the big river yard entirely another year, thus forcing out the Bennetts, who in turn are reported to have leased the Gillies yard, recently purchased by the Messrs. Eckerson.

Mr. P. J. Lynch is reported to have secured a lease of the yard lately operated by Tanney & Coyne, who began business pretty late in 1904, owing to the flooding of the big Eckerson bank, but who were fortunate enough to be in the big boom of the last two years and have realized a comfortable little fortune.

John Reilly, formerly of the Reilly & Nicholson firm, is reported to have rented the Island yard near Grassy Point, which has been idle for fifteen years or more, having been practically abandoned, as it was claimed the clay was exhausted. This yard now belongs to the Lilburn estate and the material will be secured west of the railroad.

The Messrs. Nicholson will operate their other yard on the Eckerson property.

Dewitt Rowell, Mathiston, Miss., will establish a plant for the manufacture of brick.

THE WONDER MACHINERY CATALOGUE.

Catalogue No. 20 of the Wallace Manufacturing Co. of Frankfort, Ind., is just off the press. Like the previous advertising this one is attractive and complete. It illustrates several of the machines in such a way that the inner construction principles are seen at a glance. This Wonder family is growing. There are now four of them, The Zenith Wonder, Big Wonder, Intermediate Wonder and Little Wonder. The cutting tables are also of several sizes and are for the making of brick, tile or hollow blocks. The pug mills and rolls, dry pans, elevators, trucks and barrows are all splendidly illustrated so that one can readily see just what one will suit his purpose. Write to them and mention *The Clay Record* if you are interested.

TILE MANUFACTURERS CANNOT GET CARS.

Drain tile manufacturers of Indiana are complaining of a shortage of cars, and so long as they are unable to fill orders on account of lack of cars they assert there is no reason to think about increasing prices, even if an advance were intended. The tile men said they must have cars, and that the most important matter before the annual meeting was to devise ways and means to obtain cars.

EMPLOYEE OF BRICK WORKS LOSES WEALTH IN A CLAY PAN.

Russah Nikkoley, a foreigner employed at the brick plant of the A. F. Smith Company, New Brighton, Pa., recently suffered financial loss in rather a strange manner. Nikkoley is employed at the shop in feeding the pan that puts clay into the crusher, and at about 10 a. m. ran excitedly to the foreman and declared that he had been robbed.

So worked up was the man that the machinery was closed down and a search was made. The machinery was examined, and in the crusher several pieces of battered money were found and sticking to the side of the machine was found a paper dollar.

Nikkoley says he had \$160 in his pocket when he started to work. The money either fell out of his pocket or was accidentally pulled out, and fell into the machinery.

BEST GRADES ARE BRINGING \$10.50 PER THOUSAND IN NEW YORK.

Hudson river brick are bringing \$10.50 per M for the best grades to the open wholesale market, the highest price since 1882, when common hards sold in April for \$10.50 per M, and in the early part of May for \$11 by the cargo afloat. The record prices were those paid in the year 1866 following the Civil war, when common brick sold for \$18 per M by the cargo, but gold was then at a premium.

President Hammond of the Hudson River Brick Manufacturers' Association remembers distinctly that the price of brick delivered in Broome street that year was \$20. At this time last year good brick were selling for an average of \$7.87, but the ten dollar mark was touched before the water closed. The owners of brick yards along the Hudson river have veritable gold mines.

SAND OR LIME BRICK OR BLOCK NEWS.

The Lehigh Granite Brick Company, Phillipsburg, Pa., has been incorporated with \$50,000 capital stock. Incorporators: Howard E. Seyfried, Nazareth, Pa.; Henry Wentz, Frank C. Wolfe and Robt. F. Wentz, Allentown, Pa.

The Luckey (O.) Hydrated Lime Co. has been incorporated with \$50,000 capital stock by George B. Christian, N. B. Eddy, J. F. Dombaugh and J. M. Stone.

The Carver Bros., Britten, S. Dak., will put in a brick plant on their farm near town.

The Savannah (Ga.) Sand-Lime Brick Co., will increase their capital stock from \$30,000 to \$40,000 and double the capacity of the plant at Eden. The office is in the Provident Building, at Savannah.

The Florida White Brick Co., Jacksonville, Fla., is arranging to install especially built mixers and machinery and will increase the present capacity, which is 40,000 brick daily. Geo. P. Doeker is the general manager.

Frank Stehm, 310 Crocker Building, Des Moines, Ia., will be the superintendent of a new cement brick and tile plant that will be located there.

C. B. Ebert, of Chicago, is now with the American Sandstone Brick Machinery Co., of Saginaw, Mich.

Col. E. A. Forbes and associates, Marysville, Cal., will build a plant for the manufacture of sand-lime brick under patents recently purchased.

The Intermountain Building Material Co., Boise, Idaho, incorporated with \$36,000 capital stock, will succeed to the business that was to have been started by the Boise Sand-Lime Brick Co. The incorporators are: Robert Aikman, G. B. Rogers, Thos. McMillary, D. O. Stevenson, J. W. McLain and J. F. Koelsch.

The Frankfort (Ind.) Brick & Con. Co. will add a cement block plant to the works.

The Sioux Falls (S. Dak.) Pressed Brick Co. has decided to shut down and make some improvements to their plant which will take to March 1st. They can't supply the demand.

Andrew Smith has bought the entire holdings of the stockholders in the Hydraulic White Brick Co., at Wilmington, N. C. He will continue the business and later will make some improvements.

The International Sand Lime Brick & Machinery Co., New York, has been incorporated with \$100,000 capital stock by John F. Cloonan, J. A. Byrne and Arthur McCausland, who are the directors.

New York Concrete Block, Sand-Lime & Brick Co. has been incorporated with \$15,000 capital stock. Incorporators: Wm. C. Foster, Benjamin Merklen, Jr., and Robt C. Bokerhan.

The Princeton (W. Va.) Brick & Lumber Co. are in the market for machinery for the making of cement blocks.

The J. L. Roark Estate, Greenville, Ky., are in the market for machinery for making concrete blocks.

MISCELLANEOUS ITEMS.

The Brook (Ind.) Terra Cotta, Tile & Brick Co. has increased its capital stock from \$30,000 to \$75,000. John M. Haynes, president; Lawrence E. Lyons, secretary.

The Killian (S. C.) Tile Brick Co. has been incorporated with \$25,000 capital stock. The officers are: T. M. Waring, president and treasurer, and H. F. Hayne, secretary.

H. M. Kaninsky and Samuel Butters of Boston, Mass., have bought the plant of the Fiske Brick Co. at Dover Point, N. H., which they are dismantling.

Judge Joseph Rea, Savannah, Mo., is still engaged in investigating the quality of the clay on his farm and the kind of machinery to handle the clay.

The American Vitreous Stone Co., Clementon, N. J., has been incorporated with \$100,000 capital stock to manufacture brick, artificial and natural stone. Incorporators: Arthur M. Hay, Charles B. and Herbert J. Rockwell.

The Champion Brick Co., Baltimore, Md., has increased its capital stock from \$60,000 to \$100,000.

Murray Brothers, Pittsburg, Pa., sewerpipe makers, with capitalists from St. Louis, Kansas City and Denver, Colo., are considering the building of a large sewer pipe plant at the latter city.

Pierce Crockett, Abingdon, Va., will be in the market for brick machinery.

The Hancock Brick & Tile Co., Findlay, O., is building a plant at Hamler, O., which was necessary to keep up with its orders.

G. W. Isenhour of Spencer, N. C., will install a plant at Whitney, having just received a contract for 5,000,000 brick.

Burroughs & Mankin, brick manufacturers at Richmond, Va., has bought machinery to increase the capacity of their plant.

The Haeger Brick & Tile Works at Dundee, Ill., are to be greatly increased in capacity. The demand exceeded the capacity of the increased output this year.

C. W. Darden, Franklin, Va., wants the catalogues and information about brick machinery.

In the last issue of the CLAY RECORD we described the machinery of the Egg Harbor Brick Mfg. Co., Egg Harbor City, N. J., and was mistaken in the make of the brick machine and cutter used. It should have said that this machinery was made and furnished by the Chambers Brothers Company of Philadelphia, Penna.

The Schneider Brick Co., of Detroit, Mich., have placed contracts with the Henry Martin Brick Machine Mfg. Co., of Lancaster, Pa., covering the latest improved "Martin" system of handling and drying soft mud brick, of 35,000 daily capacity.

Edward Brock, Beaumont, Texas, is desirous of corresponding with manufacturters of machinery, etc., pertaining to preparing and manufacturing Kaolin and Fuller's earth.

Martin Rogers, Arcanum, Ohio, who has been running his brick and tile plant for 20 years, would sell or trade same for a farm and retire.

D. W. Jeter, Macon, Ga., wants to correspond with makers of machinery for the manufacture of jugs and flower pots.

W. F. Mitchell, Des Moines, Ia., is at the head of a movement to form a stock company with building contractors to build a building brick plant.

The New Jersey Terra Cotta Works, Perth Amboy, N. J., gave to their employes, numbering 150, from \$5 to \$20 each for a Christmas present.

The Edmonton (Alberta) Pressed Brick Co. is now adding a dry pressed brick machine to their plant, making a combination plant, both stiff mud and dry press.

The Orchard Knob Clay Works, Ironton, Ohio, will double the capacity of their plant by building four new kilns, adding a dry pan, a tunnel dryer and steam power for conveying the clay.

The Fond du Lac (Wis.) Pressed Brick Co. at its last directors' meeting, decided to double the capacity of the plant by adding a new machine and a pulverizer and a 150 h. p. steam plant.

The Utica Pressed Brick Co. has secured land and let contracts to build its plant on same at Canastota, N. Y., on the Lehigh Valley railroad.

Another company has been organized to make brick and tile at Kellogg, Iowa.

About fifty Bohemian architects, contractors and builders of Chicago have organized a \$100,000 brick company and have secured forty acres of land at Chicago Heights, Ill., just southeast of the new plant of the National Brick Co.

The Horseheads (N. Y.) Brick Co. has closed a contract with New York parties for the delivery of 7,000,000 brick.

C. W. Goldner is now the superintendent of the brick and pottery plant being erected by Peter E. Iler at 2nd and Hickory streets, Omaha, Nebr.

The American Brick Mfg. Co., Wilmington, Del., has been incorporated with \$250,000 capital stock. The incorporators are all from Wilmington.

The Denison (Texas) & Sherman Pressed Brick Co. has been incorporated with \$25,000 capital stock. Incorporators: R. E. Krueger, J. C. King and John Windsheimer, all of Sherman.

The General Fireproof Construction Co., Buffalo, N. Y., has been incorporated to manufacture brick, tile, cement and earthen products. Capital, \$10,000. Incorporators: C. E. Green, of Buffalo; Thomas Shannon and John B. Sheridan, of Cleveland, O.

The Kensington Brick Co., Berlin, Ct., has been incorporated with \$25,000 capital by John Carbo, E. S. Bagley, M. N. Napli, Anton Napli and John McDonald.

The American Roof & Tile Co. has been incorporated at Charlotte, N. C., with \$200,000 capital stock by R. A. Dunn, William C. White and F. M. Sawyer.

The Middleton (N. S.) Clay Working Co., Ltd., has been organized with \$10,000 capital stock. The officers are: W. B. Ross, president; L. E. Shaw, manager and secretary.

The main office of the Karthaus (Pa.) Fire Brick Co. has been moved from Lock Haven to the works. P. L. Knecht, secretary and treasurer, resigned, and D. I. McNaul elected in his place.

W. H. Henry, of North Carolina, will open up a brick yard in the spring at Radford, Va., that will make 13,000,000 brick annually.

Two Portland, Ore., men have leased a brick plant at Oroville, Butte Co., Cal., and will erect an up-to-date brick making plant to cost \$10,000.

H. A. Hege and W. N. Kinney, Lexington, N. C., have formed a partnership and will engage in the manufacture of brick.

Williamson, Hedgecock & Fontaine, Martinsville, Va., has been incorporated with \$25,000 capital stock. E. L. Williamson is president; J. A. Hedgecock, vice-president and manager.

Philip Burns, Marysville, O., will establish a new brick and tile works in the spring. It will cost \$15,000.

J. M. Lackey, Lincolnton, N. C., is in the market for brick-making machinery for a 50,000 daily capacity plant.

The Jenkins Brick Co., Wetumpka, Ala., has been incorporated with \$75,000 capital stock. The incorporators are W. L. Lancaster, Frank W. Lull, and others.

The Saco (Maine) Brick Co. has been incorporated with \$50,000 capital stock. Officers, John Hearne, president; J. A. Durgin, treasurer, and T. A. Marston, clerk.

The citizens of Crisp, Texas, are organizing a company with \$25,000 capital to install a brick plant at that place.

Julius Gobeaux, the Everett (Wash.) pottery man, expects in a short time to open up a brick plant there that will cost \$25,000. Others are interested with him.

The Duke-Success Machinery Co., Memphis, Tenn., has been incorporated with \$25,000 capital stock. The company will absorb the J. G. Duke Machine Works. Frank H. Reid is president; J. G. Duke, vice-president; Ernest B. Merry, treasurer; Thos. L. Le Malta, manager, and Joseph Townsend, secretary. Mr. Reid is president of the Success Brick Machinery Co. and the South Memphis Brick Co.

The Glasgow (Ky.) Brick Co. has been incorporated with \$10,000 capital stock. The business was inaugurated a year ago and has been a paying venture. The plant will be enlarged.

The Katterjohn Brick Co., Paducah, Ky., has been incorporated with \$50,000 capital stock by H. W., J. W., F. W., G. W. and H. A. Katterjohn.

CLAY LAND FOR LEASE.

On a 32 acre farm, 4 miles west of Macomb, Ill., containing 20 acres of a 10-foot vein of fine pottery clay, a 5x10-foot shaft in good repair at same. Will lease from one to ten years or longer at 10 cents per ton, weighed on ground and settled for monthly. Company to have access to any part of land for mining and digging clay. Also a vein of coal 25 to 30 feet below the clay to lease at 1/4 cent per bushel. For further particulars address

MILTON McDONALD,
Lock Box 39 P. R. 5, Colchester, Ill.

FOR SALE.

One complete brick yard plant, consisting of boiler and engine, stiff mud machine, rolls, automatic cut-off, shifting pulleys, belting. Complete equipment for a 25,000 capacity plant. A bargain if sold at once.

WM. W. THIRLBY,
Traverse City, Mich.

WANTED

A man to take charge and manage a brick and tile plant. He must thoroughly understand machinery, setting brick and drain tile and burning same. The plant is engaged in manufacturing stiff mud brick, dry pressed brick and drain tile. A permanent position to the right man. State age, experience, salary expected and full particulars. Prompt action required. Address

FACTORY,
Care, Clay Record.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE CHEAP.

Freese Combination Brick Machine, 30,000 brick capacity, side-cut board delivery table, 60 horse-power Tubular Boiler, 50 horse-power Engine, 11,000 three-slat 10x36 pine Pilets, Trucks and Barrows. All in good condition. Will sell separate or whole. Address

JOHN POEHLEIN,
1600 1/2 18th St., Louisville, Ky.

FOR SALE.

Profitable running brick plant, 25,000 capacity. Ready sale for entire product. Owner has larger interests requiring attention.

TERRA HAUTE PRESSED BRICK CO.
Terra Haute, Ind.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address

T, care Clay Record,
Chicago, Ill.

FOR SALE.

For sale, reasonable, in condition—

One 5x18 foot Horizontal Tubular Boiler.
One No. 20A Penfield Hollow Brick Machine.
One 14 foot Pug Mill.
One Disintegrator,
One 40 foot Clay Conveyor, with 20 foot belt.
Forty Fire-proofing Dies, with two extensions, pulleys, clutches and belting.

Reasons for sale, are making different ware.
R. 611, W. 51st St.,
New York City.

BRICK PLANT FOR SALE

For Sale—\$20,000.00 will purchase an active interest in a well established and profitable Fire Brick and Paving Brick manufactory located in the Flint Clay District of Kentucky. Good position open to purchaser. Splendid opportunity for a good man. Address, E, care of Clay Record, Chicago, Ill.

FOR SALE CHEAP.

One Lehman Slumming Machine, One Garden City Double Fan, in use only 60 days. Write for prices etc. to
J. R. VAN BUREN & CO.
Griswoldville, Ga.

BRICK YARD FOR SALE.

One of the best pressed brick plants in Colorado. Modern Machinery in perfect order, abundances of clay. Conveniently located for both city delivery and shipping. Splendid market for product, with large orders on hand. A rare opportunity for a brickmaker. Inquiries solicited. Address

COLORADO,
Care Clay Record, Chicago.

CLAY RECORD.

Machinery For Sale.

FOR SALE

Two Wiles Soft Mud Steam Power Brick Machines. Two Tempering Wheels for horses. 40 h.p. Boiler. 30 h.p. Engine. 5 or 6 Trucks. All necessary Belt and Shafting. Also about 500 feet light Steel Rails with Switches. Everything in good working order. Will sell cheap as we have started an in-door yard.
E. T. & IRVING HAND,
Plainfield, N.J.

FOR SALE

One Komnick 1000 to 1200 per hour sand-lime Brick Press in good condition. Was replaced with larger capacity press, same make. Inquire of the
SAGINAW SANDSTONE BRICK CO.
Saginaw, Mich.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.
Both styles of cars in first-class repair.
ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address
"GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.
THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address
ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address
ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new.
DEALER,
Care Clay Record, Chicago, Ill.

FOR SALE CHEAP.

One second-hand Chandler & Taylor 80 horse-power Horizontal Tubular Boiler, 60 inch diameter by 6 feet long, with full flush front.
AMERICAN CLAY MACHINERY CO.
Bucyrus, Ohio.

FOR SALE.

One 70 horse power Frost Tubular Boiler, one 45 horse power Frost Slide Valve Engine. In good condition, will sell cheap as we have changed to electric power.
CENTERVILLE BRICK & CONSTRUCTION CO.
Centerville, Iowa

WANTED.

An experienced and competent brickmaker to take charge of soft mud plant near Cincinnati. State experience, references and wages expected.
GENERAL SUPPLY & CONSTRUCTION CO.,
24 State St., New York.

BRICK PLANT FOR SALE.

Splendid Chance for Contractor.

One of the finest, most modern brick plants for sale in southern part of Central Illinois. Live growing city, good prices, making money. Dry press, built in 1904. Best of reasons for selling. Price \$25,000, if taken at once. Address
ILLINOIS, care Clay Record.



No better made, cut lower
\$3 and \$10.15
4 Wheel, \$3.00
5 Wheel, \$3.25
Guaranteed.
Sold by all dealers

Paper Joggers quoted.

R. A. HART, 41 White St. BATTLE CREEK, MICH

FOR SALE.

Up-to-date brick plant with Creager machinery, in prosperous city of 15,000 inhabitants, in Southern Illinois. Good residence and farm of 40 acres attached to plant. Splendid opportunity. Only plant in city. Address

II. H., care Clay Record, Chicago.

CARS WANTED.

Two transfer, two flat and two turntables, 24 inch gauge. Sander wanted also.

E. T. & IRVING HAND,
Plainfield, N. J.

MACHINERY FOR SALE.

One new steam iron Quaker soft-mud brick machine, bought of the Wellington Machine Co. Seventeen iron bound molds, one dump table, all new; never been used. Capacity 30,000 per day. Address
G. W. NICHOLS,
Stockbridge, Mich.

POSITION WANTED.

Position as manager of brick or tile plant, by an experienced man. Can build a complete up-to-date plant and operate it successfully. Address

UP-TO-DATE,
Care Clay Record, Chicago.

FOR SALE CHEAP.

First-class brick and tile plant. Good machinery, unlimited clay supply, 25,000 capacity daily, 3 kilns 170,000 capacity, dry sheds, etc. Track connections. A snap if taken at once. Address

H. C. MODLIN, Secretary,
Perry, Iowa.

ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

PALLETS WANTED.

Wanted 3500 all steel foot pallets, 36 in. long by 10 1/4 in. wide by 3 3/4 high. State gauge of steel, width of foot and general details.

FAYETTE FIRE BRICK CO.
Uniontown, Pa.

STEAM SHOVEL FOR SALE.

One Barnhard Style "B" Marion Shovel. Good condition. Large enough to dig Clay for 100,000 brick in 8 hours. Apply at

ILLINOIS BRICK CO.
315 Chamber of Commerce, Chicago

FOR SALE OR EXCHANGE FOR A GOOD FARM.

\$16,000 brick plant, clearing \$6,370.40 yearly. Good reason for offering for sale.

Box 761, Muncie, Ind.

FOR SALE.

The Newport brick and Tile plant at Newport, Indiana. Address

JOHN RICHARDSON, Receiver.

WANTED.

A man to superintend the manufacture of brick by the dry process. Must understand machinery; also the setting and burning of brick. State age, experience, salary expected and give references. Address

NEWMAN,
Care Clay Record, Chicago, Ill.

PARTNER WANTED.

With experience in modern brick making. Material suitable for fire, face, enamel or paving brick. Good proposition for a hustler with some money to invest. For particulars address

W. P. ALLEN,
Enterprise, Kansas.



Vol. XXVIII. No. 2.

CHICAGO, JANUARY 30, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

A REPORT OF THE TWENTY-EIGHTH ANNUAL MEETING OF THE ILLINOIS CLAYWORKERS' ASSOCIATION.

The twenty-eighth annual meeting of the Illinois Clay Workers' Association, its enrollment showing an increase in membership of 20 per cent above that of the preceding year, was called to order by its president, Mr. John W. Stipes, in Elks' Auditorium, Champaign, at 2:30 p. m., Tuesday, January 23, 1906.

The meeting was opened by an announcement from the president that owing to sickness in the family of His Honor, S. A. Blaine, mayor of Champaign, it was deemed inexpedient for him to be present to deliver the address of welcome; that it was his great pleasure however, to introduce Mr. John R. Trevitt, who would fulfill this function in place of the mayor.

ADDRESS OF WELCOME.

Our mayor had promised himself this pleasure, but he has been unavoidably detained, and has requested me, upon his behalf and in behalf of all our citizens, to extend to you a welcome. I don't know that I need say to you that we take considerable pride in the fact that you have chosen our city for a second meeting. We think you must have a kindly feeling toward us at least.

It is the wish of our mayor, as it is the wish of all of us, that you have not only a profitable time—and that, of course, you will attend to yourselves—but that your visit or stay with us shall be pleasant in all respects. I know that our mayor intended to extend to you the entire freedom of the city, otherwise he would not have sent his police commissioner here to welcome you. (Laughter.)

Your president has given me permission to tell you just why the mayor is not here. The facts are these: Our mayor is a very ardent Republican, and a great admirer of President Roosevelt, and since the president issued his dictum in regard to race suicide there has been lots of business around at the mayor's house. (Laughter and applause.)

It is our wish that every convenience and courtesy, every facility and opportunity for pleasure be extended to you, and if anything is overlooked or anything lacking, it is the fault of your worthy president. (Laughter.) The fact of the business is that Mr. Stipes practically owns this city, and he has anything that he is disposed to ask for. He started in here years ago in the tile business. He drained all the water off our farms around here, and all the money out of the pockets of the farmers. Then he started into the brick business, and put up these brick buildings around here, and pretty thoroughly covered our streets with pavement, and incidentally he has covered all our property with bonds, and is recognized as one of the "millionaires" of the city. (Laughter and applause.)

I don't know much about the clay workers' business, and I cannot say much to you on that line. All I know about it is what my friend has said to one of your members a while ago: "Dig up money enough to pay to register among the brick and tile people and become a clay worker." (Laughter.)

The first clay worker I remember about was Pharaoh, and I believe he had some trouble in his business. He was in the brick line, and his people went on strike because he quit furnishing the straw. Moses was a kind of walking delegate, and he made lots of trouble for the old man—I presume you have troubles also in that way. (Laughter.)

But really, the tile business has been the means of redeeming our territory here from swamps and changing it into productive, rich farm lands, so that our section has become one of the wealthiest in the state.

If the price of lumber keeps going up, we will have to depend upon the brick men for residences and business structures, so that our good wishes are with you for all of your efforts in the brick line—and the other, too, I suppose, although I don't know anything about the other part of it.

I hope you will come again. We don't want to be selfish, but wouldn't mind if you would make this your headquarters for all future meetings. (Applause.)

PRESIDENT'S ANNUAL ADDRESS.

My friends, you are aware that it is written in the good book, "To everything there is a season, and a time to every purpose under the heaven." A time to weep, and a time to laugh. A time to mourn, and a time to dance. A time to break down, and a time to build up. One year ago you had your time to laugh when you made choice of me to pose as president of this association. I had my time to mourn for a whole year—mourned that men whom I had learned to love because of their many excellent qualities should unpremeditatedly act so unwisely. But, gentlemen, believing that you, too, sorrow for your one rash act and are now penitent, I forgive you, knowing if prosperity attend our labors it must be a harmonious working together with our combined wisdom for the best end.

In point of time our organization is yet young, yet to us who are so firmly wedded to its grand purposes and aims, its strides have been magnificent. And the past twelve months cannot be noted as exceptional. Our friends and helpmates, the "Clay Worker," "Clay Record" and "Brick," have not only had a watchful eye upon us in our individual capacity, but have gathered and disseminated, so that in point of useful facts the association today is as one man, and we are again ready in our fraternal organized capacity to commend,

criticise or condemn. And then with a zeal consistent with the purposes of our organization we must go forward.

I would like to pause here, and if I were competent to do so, take up the individual items of work that were planned a year ago and trace the progressive steps that have been made. But in doing this I would trespass on the fields of work assigned to the various committees, from whom we shall hear in the proper order of business.

And while I have many things that I would like to say pertaining to the details of our common work, courtesy demands that I defer to you who are older and wiser than I. Yet there are, in my opinion, fundamental issues that should ever be kept before us as governing principles never to be lost sight of. We do not magnify our organization when we say, as we know, that the "Clay Workers" are second to no association in this great state of Illinois. And when we say this it is not for the mere play of words; it is said with a meaning that challenges refutation.

What is the character of the balances with which we shall weigh ourselves? You will answer, "The greatest good to the greatest number." True. A few weeks ago the National Bankers' Association met in the city of New York, and one of the wise things they did there was to confer the honor of president of their association upon a worthy citizen of the state of Illinois. Recently some two hundred men of the clan lighted down on the little town of Hoopes-ton and banqueted their president, John L. Hamilton. John, in response to their greeting, reminded them that their combined millions represented finance and financiers marvelous.

It is by comparison sometimes that we are better able to see our greatness and our littleness. It would be a pleasing task to make comparisons from several standpoints between the Bankers' Association and our own, but my time limits me to one, to-wit, the Bankers' Association has a membership of seven thousand and seven hundred, made up of the leading bankers from the different states and Alaska, Cuba, Hawaii, Porto Rico and the Philippines.

Friends, have you ever thought of the army of men in the, not the whole United States and the islands of the ocean, but in the state of Illinois, that are looking to us for work, for a sustenance for themselves and families? In the assuming and the strengthening of our organization we are taking upon ourselves a grand but fearful responsibility. Machinery has taken the place of men, and co-operation weakens self-reliance. The man out of a job today is far more helpless than the man of fifty years ago. So, friends, when we come together to deliberate, it must not, it cannot be, alone as financiers, but also as humanitarians. Hence, the importance of having far-seeing, liberal-minded men in the ascendancy in our deliberations. And to this end we cordially welcome the inventor, the artisan, the educator, the schools and the man of letters as our helpers and co-workers. And just at this time, when the whole world is talking peace, when swords and spears are being beaten into plow-shares and pruning-hooks, the laboring man must multiply rapidly. We do not pose as dominant financiers, but as workers, "clay workers," we do not aim at riches. We believe with John Ruskin that life without industry is guilt, and industry without art and education is brutish. We have not been lacking in industry, but we were not making the rapid strides in art and education that some of you thought our association had a just right to attain to. Hence the action at our last annual meeting in appointing of a committee to visit our state capital and impress upon our legislators the necessity of a school of ceramics. That committee was successful, and we shall listen with pleasure to their report. Just what this school may mean for the state of Illinois none of us dare predict. But I am sure we thank our legislators, and trust that the time is not far away when we shall be permitted to say to them, "Honorable gentlemen, you builded better than you knew."

Again, the year 1905 has been a very prosperous year for the clay workers. There has been a great amount of building, also a considerable amount of paving. I think this part of the clay industry will be greatly benefited by the change in the special assessment law. The large crops and the high prices throughout Illinois will have a

tendency to make money plentiful and when this is the case people are more desirous of making improvements. It has been demonstrated for the past two or three years that investments in real estate have been profitable, and in my judgment will continue to be so for some time to come. If so, this is a good time for the clay workers to get their plants in good shape to meet the demands.

One of the important things is the building of the interurban lines. It is helping in a large measure to advance the price of lands. It is also the means of bringing the people in the country in close touch with the people of the towns and cities, and this will broaden the views of both. It will also make more liberal spenders of the country people and spending the money is what makes business. The price that Illinois land has reached, especially in central Illinois, is from \$150 to \$200 per acre. The advancement in the price of land will compel the owner to underdrain, so as to derive the greatest benefit from the high-priced land. This will help the tile man.

It has been demonstrated that the system of Prof. A. N. Talbot for the disposal of the sewage is a success. This will make it possible for the cities and small towns that do not have large streams flowing near them to have a sanitary sewer system. In time all small cities as well as large will construct sewer systems, and this will create more of a demand for sewer pipe. So I predict the year 1906 will be a banner year.

I am pleased to see so many of you come back to Champaign, as this is my home. I am exceedingly desirous that each and everyone of you shall have a pleasant and profitable time. The excellent program that is prepared for you I know you will enjoy. If there is anything that I can do to make your stay in our city a pleasant one, do not hesitate to call on me.

The president's address was followed by the report of the Committee on Clayworking School, by Frank W. Butterworth, chairman of the committee. Other members of this committee: William Hammerschmidt, Walter Colyer, John W. Stipes, D. V. Purington and Dr. A. L. Converse.

REPORT OF COMMITTEE ON CLAYWORKING SCHOOL.

I have not very much of a report to make—I don't know about making *any* report on this legislative committee. This "graft" investigation has been going on so strongly in the past year, and the chairman of this committee, here, had three hundred dollars to spend with the legislators—and there may be an investigation. (Laughter.)

The committee met in Springfield, first. The primary object of it was to consider ways and means of getting an appropriation. The amount talked about here was \$50,000—\$25,000 a year. We had no thought at that time of reducing that. The principal thing brought up at the discussion there was whether we should not make it more. Understand, of course, this was the first meeting.

We divided the thing up a little bit. Mr. Colyer, who was appointed on the committee on publication, being in the newspaper business, was to get it before the people prominently all over the state. We wanted an appropriation to play with. Mr. Hammerschmidt was appointed chairman of the Democratic head, so he took up his quarters at the St. Nicholas with the Democrats, and he told me that the first meeting he had with them they left him "broke." (Laughter.) Mr. Stipes and I were to take care of the Republican end at the Leland House. Of course, we were all right there; being a temperance hotel, we were all safe.

After getting through with that sort of business, as we had the time and opportunity we thought we would see the governor. He was right there, and of course all we had to do was walk right over and see him. And we went over to see him. It seemed like a very easy and simple thing to accomplish. All we would have to do would be to present our cards and we would get admittance. But we found sentinels posted, ramparts as it were, Gatling guns, and all guarded like a military camp—and we did not seem to have the pass-word. We were in the ante-room, and we staid in there for about four hours. I saw prominent people come in, go in and see the governor, and come out. We still staid there. There was a

very pleasant young man—the governor's secretary—a very pleasant young man there, although we found him considerable of a stumbling-block. And we staid; and after staying there a long, long time, I went up and asked how soon he thought we could get to talk with the governor. He answered us this way—and his remark became a watchword for this legislative committee all through the session of the legislature—he said, "Patience and perseverance will drive snails to Jerusalem." (Laughter). And, gentlemen, if "driving snails to Jerusalem" required patience and perseverance, this job that you gave us to do down there certainly required more, much more.

We finally saw the governor the next day, however, and had a very nice talk with him, and he gave us some encouragement, although he thought we were probably working along the same line as that of the Geological Survey bill introduced to advance geological work all over the state. We explained to him that although we worked in harmony with the Geological Survey, ours was not the same thing at all.

Well, the next morning we held another meeting, and thought we would go around and interview some members of the legislature. They were all very glad to see us, and didn't think we would have much trouble getting through our bill asking for \$50,000 appropriation. The cause, they said, was a worthy one—"but my friend, over here, will introduce that bill for you, of course. I have so many things to attend to, and this man, over here, will get it before the House." And we went off to him, and he also gave us great encouragement, but like the first one, has a friend "over here," and that friend had another, and *he* had one, and finally we wound up at the original starting place. (Laughter.) That was about the result of the first visit. We went down again, and encountered about the same thing. Finally, we got some of them interested, but I think we made about fifteen trips.

Finally, however, the matter began to receive some attention, and we got the bill through. But every trip we took off about \$2,000, and at the end we considered that we had been very lucky indeed to get ten thousand dollars instead of fifty—and I think we were, because it was a start, anyway; so we got \$5,000 a year.

The expense of the legislative committee amounted to about the amount donated here—about \$300—for hotel bills, printing and such as that. However, we got that much money for the use of the school.

And the work of the Clay Workers in getting this appropriation is not finished. We should stand right back of that school and earnestly do everything we can to make it a success in every way—in advice, backing up its merits, getting the younger generation interested in it so that they will attend it. (Applause.)

President Stipes: Has anyone any remarks to make upon that report? Professor Rolfe—

Prof. C. W. Rolfe: I may take occasion to make some remarks upon this report later on. At present I think the members of this association should give to the committee a vote of thanks for their enterprise, faithfulness, perseverance and success in accomplishing the purposes before them and for which they were appointed. (Applause.)

I did not intend to say anything on this point at all, and did not expect to be called upon to do so. One thing ought to be explained, however. At another session of the legislature we started out, as you did, to get an appropriation for surveying the clay-beds of Illinois and for instruction in ceramics. The one part, relating to survey, was separated from your bill and added to the general geological survey; and consequently an investigation of the clay-beds of Illinois becomes a part of the geological survey, and the question of the appropriation coming up at the same time as that of the geological survey, it was thought it would help the vote. The appropriation for the investigation of the clay was not the amount that had been anticipated. I think, however, that the average legislator will always be disposed to treat the clay men in this state fairly in regard to this matter, and to do for them anything that he may do.

I hope the closing remarks of Mr. Butterworth will sink very

deeply. The clay school is ordered, and it will be opened for instruction the beginning of week after next. We are doing at the university everything we can do to make that school a success; but it will be difficult to keep students in attendance, and little good it will do to young men if young men do not come. We have so far two enrolled, and we have inquiries from six or eight others today. They will get a scholarship which has been voted by the university for the purpose of encouraging ceramics at the school. I would be very glad indeed if this matter should take hold enough on these gentlemen here so that each one of you would feel disposed to send his son, or a brother, or some young man to the school; get them interested and induce one at least to attend the university and to take one of the courses that has been offered for instruction in clay work. I presume every person in this room has received a circular containing the course of study. I have used the very best means at my command to get a complete list of the names of the clay workers of the state and their addresses, and have made an effort to send a communication to everyone of these addresses.

I presume everyone here has received a copy of that circular I have referred to. If not, hand in your name here on a slip of paper, and I will see that you get it. I would be very glad indeed if some time during the week every member of this association would hand me a list of all the clay workers and people who are interested in clay working within forty or fifty miles of their own plant. I do not know of any better way than that of getting a reliable list. I could then compare the lists thus given me by the members here with the list I have on file, and could then feel that I had an accurate list of all the clay workers in the state. Besides, a good many times we want to communicate with you, and you with us, upon points of mutual interest, for which such a list of names and addresses will be found invaluable.

Let me close as I began, and recommend a vote of thanks to this committee, who, if they had but accomplished one-half of the work they actually did complete in behalf of the clay workers last winter at Springfield, I should have said that they had fought a good fight and had well deserved an acknowledgment of gratitude from those in whose behalf they had labored. (Applause.)

W. D. Gates, Chicago: I think this association most fortunate in having a committee with the ability and will to undertake and to do the work that this committee did. I should like to add, however, if I may be permitted, that a large, gold medal should be conferred upon each one of the members of the Illinois legislature who voted for the bill as it was finally passed; but perhaps that will not be necessary if the association will take action similar to that which this committee took in falling only two thousand dollars on each visit to the state governor. It's a wonder to me that the gentlemen of this committee came off at Springfield as well as they did in the matter of expenses and disbursements there. I was a member of a committee at Washington once, and we had a great deal of trouble in getting our tickets redeemed, getting our baggage back—and when we got back we had nothing. (Laughter.)

Now, this business has only started. We have made wonderful progress in introducing this school, in getting men at the head of it who have the ability and energy to push it forward. But the committee have not done all that is to be done—have not finished the work. They are men who are interested in this work, and I know they are going on with it with the same unabated, commendable zeal, just as they did before. But I think we are all members of a committee to push this school along, to do and work for this school, and to see that our immediate neighborhood becomes interested and that the eyes of all are opened to the absolute necessity of such a school.

I can go back and see the marvelous change that has come over our craft in something like twenty years—from the day when we were all in darkness, experimenting with a handful and combination of this, that and the other thing, observing results; then taking a handful of something else, and another, and so on, keeping up the process and searching, experimentally, for something to produce certain desired results, and failing, trying something else—some

other combination; now, that was working in darkness. I know, when I started, I couldn't obtain any literature on the subject at all. Every door was locked. I knew nothing about some of the most vital matters relating to the business and processes in clay working, and had simply to go to somebody often and wring out of him what some person had said could be done with such and such materials, and if you couldn't get just those materials, and in their proper proportion—then you were absolutely in the dark! Now, these associations, and schools that have been established, have brought about an entirely different condition of affairs. Clay working has come to be a recognized science—modern clay working—and it is an evidence of broad-mindedness among all people. And let us not sit down satisfied with a thing partially accomplished, but believing in the future of the clay working industry, let us second, supplement, fill out and as nearly as may be, complete the work that has been initiated in so able a manner.

With the facilities furnished him, the clay worker of today has less need to consume time with experimentation. The information he gets from institutions of learning gives him a very, very great advantage.

Now, that is what these schools are doing—what *this* school is doing in *this* state particularly, and we have a state here with untold treasure underlying it—no one knows all that is underlying it—and this school is going to promote the clay working industry of the state beyond all our dreams. And what we want to do is to help that school all we can, let our own neighborhood know it is here, and that it is here for a purpose, that its purpose is to let the young men in to get the benefits of knowledge, training and education that will enable them to build up this business. And we want to be very, very grateful for all that has been done. The committee has done well, and I honor them for having done all that they could do to aid this work.

The motion that a vote of thanks be tendered to the Committee on Clayworking School for the work accomplished by them having been duly made and seconded, was submitted to the meeting and carried unanimously.

The president announced as the next subject upon the program a paper on the "Relation of the State Geological Survey to the Clayworker," by H. F. Bain.

ADDRESS BY PROFESSOR H. F. BAIN.

H. F. Bain: I am not much on reading papers. I wrote one and turned it over to the secretary, and I suppose, if finished off with some revision, it might be readable; but I would prefer just now to be excused from doing the act in that form, and to proceed to have a heart-to-heart talk with you on this matter.

As Professor Rolfe has explained, there was a mix-up of the various bills. A part was taken from the bill relating to the clay workers' part of the work, and a part of the money, and was added to the bill of the general Geological Survey. I was not here at the time, nor had I the slightest expectation of being here; I only know what people say.

The reason for that was that the work which they proposed to do was exactly the sort of work expected of the Geological Survey—having relation to all the mineral resources of the state—and it was thought better to consolidate the two, the results of the survey to be applied to the uses of the school. Acting on that basis, at the first meeting of the commission, the one at which I was elected, and which also accepted Professor Rolfe's resignation to go upon the Clay Workers' committee, acting on my own authority and trusting that the commission would act in the matter afterwards, I made an allotment for the clay work; and, as I was informed yesterday, that allotment as planned, and the work, were approved in every way.

I will explain this—that the money was specially appropriated for the school of ceramics. Nothing was allowed for instruction. It was to be used for the equipment of the school. And so far as investigating the resources of the state was concerned, there was no provision, unless it was understood that it was to be with money taken from the appropriation for Geological Survey. Now, if we

were to pay for Mr. Purdy's time, physical tests, chemical analyses, printing, reports, and all that line of work, it stands to reason that even with the full amount of money appropriated for the Geological Survey it was not possible to do in one year all the work planned to be done.

And so we make our plans as to what kind of work ought to be done, and take it up piece by piece; and we are happy if the legislature will favor us with the means to do a part towards the completion of our investigation from time to time. But for the present, we will have to take up one part only; just as Professor Rolfe, in arranging his duties, might not have determined as to the question of paving brick in just what order it should come with reference to instruction on pottery, structural brick, clay tile and other works in clay, and the various questions relating to the sorts of clay to be used.

Now, a portion of this work, that is actually field matter, is the question of deposits taken in connection with the mapping of the clay and other resources of the state. It is, of course, more economical to have a man go into a given region and map it out with reference to the coal, clay and other deposits, than to send a separate man to do those things, relying upon a special expert to assort and particularize details. It is along that line of co-operation that we propose to work.

You know, perhaps, what geological survey is. For a good many years most of the civilized states and countries, and perhaps many of the uncivilized as well, have had geological surveys. And there has been some difference of opinion upon the subject of geological survey, what it is, its object and necessity. But it is generally understood as having a direct bearing upon the education of the people in the mineral resources of the country. It has the support of the government and the people.

Everything which geological survey does must have some practical bearing in view. It is without the province of geological survey to take up the survey for purely scientific purposes. Science enters into it—there is a scientific side to it; but we want to take up those lines that lead to something of direct practical benefit, like that relating to the organization of the clayworking industries which we have in hand here. And our particular field, of course, is among the raw materials and not the finished work.

Now, in making this up we want to get as much advice and help as we can. We don't want to start in to do the work and not get it all finished. We want to print it, and send it out, and if you will give us your criticism now you won't have so much of it to give after we get through. So I invite you now to give us your ideas, what you want done and what you think ought to be done. I have turned the clay business over to Professor Rolfe and his assistants. At the same time I will tell you this: I expect to look after the coal personally, and have made the same sort of a statement to the coal men. We have had an immense amount of help from the coal men, have had much assistance from them, and they are going to be helpful as the work goes along.

So, in closing, I will say, I am very glad to have met you, and hope to know you all better at the close of the work. (Applause.)

RELATION OF THE STATE GEOLOGICAL SURVEY TO THE CLAY WORKER.

Within the last century more or less extensive geological surveys have been made by practically every civilized country. These have been of all degrees of excellence, and the bureaus which conducted them have varied greatly in organization, in resources and in plans. In practically every country, however, the utility of the survey has been recognized, and the fact that it is a proper line of official activity has been accepted by all forms of government. In the United States both the federal and state governments have taken the same view. The early military and other governmental expeditions through the west usually included a geologist, and from this beginning the present United States Geological Survey grew. In 1905 this organization celebrated its twenty-fifth birthday. It now has an annual appropriation of only a little less than two million dollars.

The state bureaus have been far less elaborate. Their resources have ranged from \$250 a year to \$100,000, but in the aggregate the states have spent and are now spending considerable money in support of geological work. It needs no argument to one who has ever asked a state legislature for appropriations to convince him that there must be substantial return for this money or the work would long ago have stopped. It is, I believe, the honest purpose of every state geologist to give honest returns to the people for the money appropriated, but there is much difference of opinion as to just what work should be taken up and how it should be carried on. In organizing our own survey these problems have occasioned much discussion, and I am very glad to be able to go over the matter with you with a view of getting your suggestions and advice. It may clear up matters a little to consider first the general purpose and nature of a geological survey.

A geological survey, and by that I mean the bureau or organization which is charged with the work, is primarily an organization for applying science to industry. Problems of research which are strictly scientific in their bearings are not the primary work of such an organization. It is always difficult to tell when a strictly scientific inquiry may begin to throw light upon a very practical problem, and it is not always easy therefore to draw the line between a scientific and a practical investigation. It is safe to say, however, that it is outside the main purpose of the survey to attack any line of research which does not give rather definite promise of practical return. In the past there has been no attempt to enforce this rule in any narrow or petty spirit, and I think it safe to assume that in the future a reasonably broad interpretation may be expected. When money is appropriated it is none the less a condition or tacit agreement between the officers of a geological survey and the people, and we should be as loyal in living up to it as though it were specified in the act. It seems to me, though, there is no consensus of opinion on this point, that strictly technical investigations of machinery and processes are almost if not quite as much aside from the main purpose of the geological survey. In Illinois there is extra reason for assuming this ground, since the state, through its very excellent Engineering Experiment Station and the Department of Ceramics of the University, makes direct appropriations for this work. Our own investigations must deal especially with materials and in a supplemental manner with products. Our problem is to bring to bear the best that science has to offer on the materials and products of the mineral industry with a view especially to stimulating the development of the industry and, as we may, improving the product. The first is our main purpose, and to it our main efforts must be directed.

In answer to the question which might be asked, why the state should do this work rather than individuals, it may be pointed out that a certain range of broad problems is beyond the resources of any individual operator. Even when the individual might have the funds and the disposition to examine, for example, all the fire clays in the state before locating his plant, it is certainly better for an official organization to do this and place the information at the disposal of each intending investor than to suffer the economic losses incident to repeated and less complete investigations by individuals. It is the old doctrine of the greatest good to the greatest number. It needs hardly to be stated that such information, collected at the expense of the people as a whole, must be freely given to them, and that proper safeguards must be adopted to prevent the funds being used on purely personal investigations for the benefit of a few. It is this requirement which prevents the survey, in the absence of specific appropriations for such work, from making free assays or free analyses except as they fall in line with some general investigation carefully selected and maturely planned.

But the work of a modern survey is not alone that of investigating. There is slight value in the mere accumulation of valuable data. The facts must be digested, put in attractive form and published so as to make them as widely useful as possible. I believe it to be as much the function of a survey to exploit, in a high class manner, the resources of the state as to merely determine what

those resources are. It is newer, better and larger industries that are wanted; more deposits used, more men at work, more money coming in from larger sales of higher class products. It is our function to do what we can to bring this about by having the right sort of information on tap or by getting it as rapidly as possible.

To consider a specific line of work in the light of these general principles, the clay investigations may be taken as an example. I take it that the information most desired is: (a) Where are our clays? (b) What sort of clays have we? and (c) For what are they adapted? Finally, in certain cases it is important to know what sort of products are now being made from these clays, how this product compares with that met in competitive markets, and whether the grade can be improved. This second line of inquiry I consider less directly a function of the survey, and yet to a certain extent we must go into these problems. To carry out these investigations we need both field and laboratory investigations. The different clayworking plants must be visited and samples of clay collected. Unworked deposits must also be sampled and the attempt made in each case to determine for what use the clay is best adapted. The field work should cover investigations of the extent of the deposit, its uniformity or variability, its situation as regards stripping or mining conditions, transportation, fuel, water and markets. The laboratory investigations should be directed to discover the nature, properties and availability of each clay. They should include chemical, physical and burning tests, followed where need be by tests of the finished product to determine its quality.

Such investigations systematically carried on should result in information by means of which the most economical development of our great clay resources could be stimulated. The information should be published in the form of maps, charts and reports, and given wide publicity in the attempt to stimulate our clayworking industries and the use of clay goods. In the years to come it is undoubtedly true that clay goods are to assume a relatively greater importance in human industry than they now have, aside from the normal increase due to a denser population. To take the best advantage of this increase we must have the best knowledge of our resources and of their adaptabilities. We must know what we can do, and parenthetically I may remark we should also know what not to attempt. Our mistakes must be recognized as well as our successes. The work so far planned by our own survey contemplates the thorough study of the clays of the state now used or capable of being used. This work is being done in close co-operation with the Department of Ceramics of the university, Professor Rolfe being in immediate charge of both. The plan contemplates taking up the clays of each industry separately and studies of paving brick and pottery clays are already under way. As fast as men and money are available the other lines are to be taken up while in connection with our geological mapping the entire clay resources of particular areas are being studied.

One of the best means of studying an industry is through accurate statistics. Figures which are not accurate are often more harmful than helpful, and accurate statistics can only be obtained through the cordial and regular co-operation of the producers. It is a prime requisite in all such work that the detailed figures relating to each plant should be treated absolutely as confidential. They should never be published, they should never be seen even, except by a properly accredited and reliable official. It is our purpose to do what we can to aid in the collection of such statistics, and to that end we have entered into co-operative relations with the Division of Mineral Resources, whereby one of our men will be made an official of their organization and authorized to collect the figures on our joint account. It is believed that in this way increasingly accurate figures will be obtained and the growing importance of the mineral industry of the state will obtain wider recognition. I bespeak your particular co-operation in this work, and especially request that you give prompt attention to the official blanks when they reach you. Only totals by industries, or in cases, counties, will be published, and only totals of output and price are asked. No attempt is being made to collect figures of labor, cost, etc., such as

the census office decennially asks for. An examination of the cards sent will, I think, convince you that you may answer them without any fear of the answers being used to your disadvantage. I believe you will all see the advantage to the state of regularly and accurately collected statistics over less regular and less accurate ones, and I therefore especially request your help in this matter. In this, as in all other lines of work, we would be glad to have your free and frank criticism, and we hope by taking criticism of plans in advance to have less criticism to meet when our work is completed.

President Stipes: Is there anyone who would like to speak on this subject? There is one thing I want to impress on the next committee—that we ought to have had the coal men interested. We will have one of them, the next time, on that committee. Please remember that.

Mr. Bain: I would like to say a word. You are not the only man who has suggested that. The same suggestion came from one of the coal operating committees of the Mine Owners of America.

President Stipes: The next on the program is a paper by Mr. Walter D. Pratt, of Earlville, on the subject of "Drain Tile and Tile Drainage."

Mr. Pratt: Apologizing for the brevity of my paper on the ground of the short time I have had in which to prepare it, and on the further ground that I am about to speak on the same subject in the interest of the trade before the Farmers' Institute, I think it best not to go into detail at the same length here.

DRAIN TILE AND TILE DRAINAGE.

As the use of under-drains and later tile-drains for removing the surplus water from localities, where it was a detriment in many ways, has been practiced for many centuries, and the benefits from their use have been published in books and periodicals at different times, I think a brief mention of tile-drainage and its advantages will be sufficient.

From an agricultural standpoint it can be said tile-drained lands do not hold frost so late in the spring, and, by removing the surplus water, permits of earlier cultivation, it also allows the ground to become warmer earlier than undrained soil, thus promoting more rapid germination and growth of crops.

Farmers and those cultivating the soil readily appreciate the ease with which drained soils cultivate, requiring much less labor to prepare for and tend the crops.

They notice that when the soil is full of water to a point at or near the surface, the roots of plants growing thereon cannot penetrate below the surface in search of its food, which is obtained from the soil, and therefore will die, or, at most, make a very unsatisfactory growth.

We find that when the surplus water is removed, that the air has much freer access to the pores of the soil, making possible the chemical changes necessary to make the elements available food for the growing crops. This change, I believe, is also assisted by the soil bacteria.

Again, tile-drainage, or under-drainage, producing a porous condition of the soil, provides a large storage capacity below the surface for the rainfall, preventing loss of soil and crops by surface washing, allowing it to pass through the pores to the drains below, and in this way holding the moisture during longer periods between rains.

We are taught, also, that in dry times, capillary attraction brings moisture from below within reach of the roots of growing crops.

Under-drainage as a sanitary measure cannot be disputed, as by such means many depressions containing stagnant water have been redeemed and the source or home of disease germs removed.

When financially considered, there is nothing the land-owner can invest money in with assurance of larger or more certain profit as, by the proper use of tile, low and waste lands can be made to equal in value any of the surrounding cultivated fields, and yield usually considerably more.

Some suggestions about the drains may be in place here, such as the outlet, fall, size of tile in drains and laying to a true grade established

by an engineer. The distance of drains apart depends upon depth laid, nature of subsoil, etc.

Very little need be said about the tile used, if they are straight, round, cut true on ends and well-burned.

Mr. J. M. Mamer, Campus: I had occasion recently to be in the southern part of the state for several weeks, with my headquarters at the county seat of Jackson county. It would seem, from the talk I had with farmers there, that a very few if any of them know anything about tile drainage. Anybody there without drainage is regarded as out of style, and for that reason mainly most of the farmers of any standing have had it in for some years. But just to illustrate, with one incident, how some look at the question. I was talking to one man about the benefits that would come to the town there if they ever got to putting in tile drains. After a long talk, summing it all up, he said he thought it would be an awful job for the town to have to put in all those tiles.

J. M. Powell, Brooklyn, Indiana: Mr. Pratt's paper has said about all there is to say on the question. It is a strong paper, and the points are well taken—so well taken that no one can attempt to dispute them. We all realize the benefits of tile drainage in Illinois, Indiana and Ohio, and there is no dispute as to that. There may be some localities, as the gentleman has just explained, where they do not know the benefits of tile drainage, and possibly we might benefit our business by letting them know; but in this day and age of the world men in general have found it out. I think that the subject has been well treated in the paper. However, we could let our customers know something about the benefits occasionally, and it would help us as individuals—those of us who are engaged in the business. But outside of that, 'most everyone knows, and there is just occasionally a man who does not know of the benefits following tile drainage.

James Luther, Terre Haute: I will ask you, Mr. Powell, in regard to under-draining. How far apart should tile be laid to thoroughly perform the work of draining? For instance, suppose tile is laid one foot underground: How far on each side of the line of tile does it drain the land? Query: If laid at a depth of one foot it drains sixteen feet on each side, if laid at a depth of two feet, will it drain thirty-two feet each way?

Mr. Powell: The deeper a drain is laid, where the soil is adapted to it, the further on each side it will drain. It is not well to lay drain pipe as low as three feet in Illinois soil. There the soil is too closely packed to lay it so deep; but the most of our soil in Indiana, the "black lands," will admit of a depth of four feet, and in that case it will drain well for a distance of three rods on each side. I have a piece of land where I put in eleven hundred rod of small tile—fifteen rows of tile crossed the forty-acre tract, tile laid at the depth of anywhere from three and half to five feet—and we never lost a crop. We always got the best crops—always plowed the land earlier and always harvested the crops earlier than where the drainage was not in. And I will give it as my opinion, from my own experience and from what I have read of the experience of others, that tile will drain three rods on either side in that soil; and in some soils it will drain six or eight rods, and in some not over a rod. I think in ordinary drainage tile should be laid at a depth of from three to four feet.

President Stipes: The next subject taken up will be "Clay Products in Our Recent Fires," by W. D. Gates, of Chicago.

CLAY PRODUCTS IN OUR RECENT FIRES.

A good many years ago, I remember, my mind goes back to the first event I ever attended of this nature, an Illinois convention; and I cannot help but think—if I may be allowed to wander from my subject for a little while—of the change there has been in the intervening time, change in the character of the men, change of the methods of obtaining information, a general change of the situation and workings of our trade. I remember at that convention I came down with a sample of clay in my pocket, showing it to everybody. And I ran down an old veteran there once, and was talking to him, and reaching in my pocket for my sample of clay,

I found it was not there—some thief had taken it! I said, "I wish I had that sample of clay to show you." And he said, "My friend, I have been twenty years in the business, and I am frank to confess to you that I couldn't tell you anything about the mixture and burning of it." And I marveled at the wisdom of the old man's speech! Not in twenty years had he learned anything. But in twenty years we have learned how little is to be found out in the clay business.

I suppose you have found out men, like I did, and with hypothetical quantities of clay have tried to argue with and illustrate to them—men in all walks of life, in the hardware business, in the dry-goods and grocery business, lawyers, ministers and physicians, who would become interested in your talk and argument, and watched you while you handled the clay; men who have not known the difference between a clay bank and a national bank. (I think there is a difference, although there are some who have the idea that if they can own a clay bank they are on the road to being able to own a national bank.) They have become interested in a clay bank and invested. These men are coming in all the time, and experiencing trouble, what do they do? Instead of taking the course they should take, as in case of sickness calling the physician, or of legal trouble the man who is expert in the legal profession, they waste time in experimentation. Finally, in their dilemma, they do go, perhaps, to some one supposed to be an expert in the clay business; and such a man who has seemed to single me out as one able to help him to some extent, I attempt to tell the truth to—give him as truthful account of his case as it is possible to give—and he goes off seeming to think that I have been trying to "down" him, and he is my enemy.

Now, I have all along held the theory that God Almighty made these great beds of clay throughout our state and the world, designing that they should be mixed; and to make those clays valuable they must be mixed with brains. Now, when everybody looks doubtful, and tries to find out where we get our clay, I have never succeeded in demonstrating to them where we got it. The best results are from mixed clays—God Almighty has left it to us to mix those clays. We have three or four clays on our place, from neither one of which is made the article of merchandise, but by mixing them we may produce the most elegant article of commerce. It may be by the mixing in of something from the outside, but it is our business to find out the required article, the proper ingredient to be intermingled with the staple, raw material entering into the composition of our wares.

This, of course, does not look like getting down to my own subject. I do not know what "my own subject" means. When I received a letter from my secretary the other day—and he is the most affable secretary—he told me they had sized me up for a subject at the annual meeting, but didn't say a word as to what that subject was going to be. When I looked at the program, though, I read "Clay Products in Our Recent Fires." I thought, "What recent fires? Am I not turning out clay products from fires all the time?" Then the horrible thought struck me, "What are we getting out of our kiln?" and you know that is a subject too sacred to bring up before us. Then it occurred to me that possibly it might refer back to the Baltimore fire. I remembered my resolution at that time to resolutely begin the work of inquiry. I went to work by a labored process to make tests, and simply marked down a great many things that were failures; and still we tussled for the pearl, the product that would withstand all tests—to the coal merchant and to the oil man, and to different places we distributed our surplus. And I let it go.

I suppose you all know as much about the Baltimore fire as I do—and all the fires except our *own* fire, and that is personal.

Immediately after the Baltimore fire a great many of our Chicago architects went down there, as well as others, to study on the ground the effects of the fire. Unfortunately circumstances would not allow me to go, and I did not have the opportunity of studying at Baltimore the effects of that great fire. But I have given study to the subject.

Now, you know, that at the Chicago fire there were certain buildings that stood almost undamaged from the effects of that fire, and the universal verdict from all the experts who ever investigated the

subject has been that well burned clay withstood the effects of that fire better than other material.

Many things must be taken into account. I remember the discussion between the cement men and the clay men. I know we had a meeting of the Architects' Club, where they had an expert hollow-tile manufacturer read a paper applauding the achievements of hollow tile in that fire; and immediately the cement men came back at them with a summons for a grand rally of the cement men—and we had quite an argument—or rather, I did not, the rest did. I appealed to the warring factions, and suggested the propriety of taking that fire lesson seriously and saying to ourselves, "Let us study the fire each one for himself, and not run down the other man's material—see how each can be benefited and make better work."

Everybody knows that we have the material that resists heat. Everybody knows that when we start a fire in the kiln the fire blazes up against the crown wall of the kiln, and is increased day after day, playing on the under side of that nine-inch brick wall, upon which you can walk up and down, walking upon it as you could upon no other material; you know you can do that although the heat is continuous and increasing. You know, and everybody knows, that when you want lining for a furnace of any kind, you go and get fire brick. But there is another thing that enters into the manufacture of our ware that is to be taken into consideration, not as universally realized. We have all been working to make a product of great resisting qualities, but do not think that we have taken into consideration what is wanted to make ware for standing fire. People jump to the conclusion that because our ware is made in a heat of from 2,000 to 3,000 degrees, therefore it is fire resisting—fire proof. But coming back to your furnaces, you do not take any clay to build up your furnace. You know where to get good fire brick, and you get them at that particular place. If you are building a furnace for exceptional heat, you get exceptionally good brick. If the heat in the furnace is not to exceed a certain temperature, you get the kind of clay that will best stand that action. Silica brick will stand continuous heat better than sudden heating and cooling. And we have to take into account the proper burning of the clays so the brick will stand the alternate heating and cooling.

Some pictures are shown of the Baltimore fire results that are misleading. One picture I saw of a rotunda entrance, where apparently all the tile had dropped off. A little investigation showed that after the tile men had put in their ceiling, the marble men came around to make some alterations and do some finishing work, and had taken a hammer and broken off the tile; and this was shown as an example of failure of clay in fireproof construction.

The question of mixing enters very largely into this subject, the texture of the goods. Upon this largely depends the resisting qualities of the ware to sudden heating and cooling. The sudden throwing on of water also is a matter that has to be reckoned with, and the resistance of the ware to treatment of this character while at a high temperature depends largely upon the quality of the clay. That is one of the interesting lines of investigation. You may burn two or three or more articles of clay at the same temperature—that is, at 2,000 degrees—and get entirely different results. You know (and I have used the illustration before somewhere; I think I spoke of it to the paving brick manufacturers), agents will come into your office in the city sometimes with a lamp chimney, and boldly throw the article down on the floor. It does not break, and you buy it forthwith. It has been tempered with reference to the work that will be required of it. You temper your cold chisel with reference to the particular work it has to do; it is of just as much importance that you temper your ware, and it is with the same objects in view—made equal to the demands that may be made upon it. There is the greatest necessity of watching the heating of the ware, because, as Professor Orton has shown, there are a great many things that are points of danger in heating; and the points of danger in cooling are just as great.

I was speaking to someone today of a little experiment at a laboratory which was put in for experimental purposes. Three little porcelain vases were placed in the furnace, and were burned to the

regular copper color; then conditions were changed so that the vases were burned to the blue color; and again changed so that they were burned to the red—all from the same blaze, the same temperature, the same material, all in the same kiln. The changes were simply due to physical changes in the oxide of copper.

Now, I didn't come here to make a long talk on this subject; but that is the way it strikes me—that we should study the effect of fire-resisting qualities just as we study to get ware for particular use in furnaces; and I am satisfied that we will gain a remedy for our ware in this regard. We want to feel our way. Get an idea of how great a heat a particular ware will stand under test, but remember it will not take that heat and stand it under all circumstances. There are some questions involved that are new to me. Many a startling proposition will arise in the course of investigations and experiments.

Gentlemen, I am glad to have been with you, but will not take up your time longer.

Mr. Butterworth: Might it not be, Mr. Gates, that this Baltimore fire, being a very unusual fire, is not away beyond the limit at which to set the resisting powers of our ware? Would it be a good idea to try to make ware of such a nature that it would be certain to resist a fire of that character? Better take into consideration that that was a very unusual fire and try to meet ordinary conditions than to attempt to go so far.

Mr. Gates: Our fires are usually very "unusual" fires. I believe in making the best test possible.

D. O. Loy: It would be well for the brick men and the clay workers to build their factories so perfectly that no fire could destroy them. Then, in case of a conflagration our buildings would stand as advertisements of having survived an extraordinary test; they would advertise to the world, "There is clay workers' material that no fire can destroy."

Mr. Gates: One thing might interfere with Brother Loy's theory—one thing, and that is, we have a house or shed on another's place; we couldn't build fire-proof and didn't have time, and it wasn't in the nature of the thing that we would build fire-proof on property outside. We didn't have time enough nor money enough to build fire-proof. When I go to the next world, however, when I feel the question urgent enough, I shall build fire-proof. (Laughter.)

The next subject taken up was "Some Ways in Which the University Offers to Help the Clayworker," by C. W. Rolfe.

SOME WAYS IN WHICH THE UNIVERSITY OFFERS TO HELP THE CLAY-WORKERS.

One year ago I came before you with two propositions which were favorably received and which you, through your committee, have carried out. I come now with my report.

Just here permit me to say that the clayworkers of the State owe much to the members of this committee for their intelligent and unselfish activity in presenting and urging these matters before the Legislature. It is my opinion that the bills would not have passed except for their whole-hearted efforts.

While these matters were under consideration before the Legislature the Clayworkers' Bill was divided, and that portion of it which provided for a survey of the clay resources of the State was attached to the General Geological Survey Bill with a reduced appropriation. This reduction I cannot but consider as most unfortunate, but, as Dr. Bain has already told you, your interests in this direction will be looked after by the Survey, and their investigations will be pushed as rapidly as the small appropriations made to the Survey will permit.

The other portion of your bill, which provided for the installation and equipment of courses of instruction in Ceramics, passed without material change. This bill carries an appropriation of five thousand dollars per year for the support of the School, and my only regret in the matter is that we were so modest in fixing the amount asked for. I hope that when your new committee shall be appointed to present the needs of the School to the next Legisla-

ture, it will be instructed to increase the asking. I also hope that you will see that this committee is appointed before the close of this meeting and that you will carefully select for its members persons who will have large influence with our Springfield friends. I ask this because it seems to me that we should have all our plans formulated and our bill before the Legislature before your next winter's meeting.

The senate committee struck out the clause creating an advisory committee but President James, acting for the University, appointed Messrs. J. W. Stipes, F. W. Butterworth, D. V. Purington, W. D. Gates and A. W. Gates as such committee.

Acting under the advice of this committee, the School has been organized under the plan set forth in a circular which I have endeavored to mail to every clayworker in the State. Laboratories have been equipped and a small kiln house capable of accommodating two small kilns, frit furnaces and a dry pan with motor, has been erected.

We hoped to have all these things in place and everything ready for the opening of school in September, but educated ceramists are not numerous in this country, and men having the combination of college training, practical experience, and ability to teach are hard to find. So, although we began our search as soon as Governor Deneen had signed the bill, and were ready to offer a good salary, it was October before we succeeded in finding a man who possessed these qualities and was not already so firmly rooted that he could not be moved. At that time we considered ourselves fortunate in securing the services of Mr. Ross C. Purdy who, in addition to a course in the School of Ceramics of the University of Ohio, had four years' practical experience in a large factory and served three years as Assistant to Prof. Orton in his School. He is also a member of the American Ceramic Society and of the National Brick Makers' Association. Mr. Purdy began his work on the first of October and since that time, in addition to advising with regard to the organization of the School, formulation of courses of study and equipment of laboratories, has been making the acquaintance of Illinois clayworkers and Illinois plants.

Within the last ten days we have also been fortunate in securing the service of Mr. Junius F. Krehbiel, who is a graduate of the New York State School of Ceramics, has had one year's practical experience as Superintendent of the Robineau Pottery of Syracuse, N. Y., and is now Instructor in the School from which he graduated. We hear excellent reports of his teaching ability. Mr. Krehbiel will begin his work with us the first of the coming month.

In this connection I wish to call especial attention to the scholarships in Ceramics offered by the Trustees of the University. One scholarship is allowed to each county in the State each year. They are good for four years and their value is one hundred and six dollars each. Candidates for these scholarships are to be nominated by this Association, but they must be able to fulfill the entrance requirements of the College of Science either by examination or by the presentation of a certificate from an accredited high school. If any county fails to nominate a candidate for a fellowship, the vacancy will be filled by assignment from those counties which nominate more than one. These scholarships will materially reduce the expense of a college course for your promising son or for any bright young man in whom you may be interested.

In way of elucidation of a paragraph in his paper, Professor Rolfe said:

Let me say in this connection something that is not written here: We have also made provision for those who do not care to take the full course, and this statement you will also find in that circular. We admit as special students to the University any young man over twenty-one years of age, and permit him to take any work in ceramics that he is fitted to take by his previous preparation. We would not permit him to take a course which he showed himself not qualified to take with advantage to himself. Anything he is qualified to take, we will permit him to take. If this young man when he enters is not able to fulfill the requirements of the

University for entrance to the University after he has completed thirty hours' work, that is, one week in the University, we will give him credit on entrance requirements for the practical ability which he may develop. In other words, after he has been in the University long enough so that we may know what his brain power really is worth in the judgment of the University, and he is found capable of taking up ceramic work, we will credit him for his ability on this requirement and allow him to take up his regular course if he chooses to do so.)

Competition is making the demands upon the successful business man more and more exacting every day, and this condition is likely to increase rather than decrease. The young man who would be really successful in business must be as well informed at twenty-five or thirty as his father was at forty-five or fifty. This is a serious matter and there seems to be but two ways in which this rapid development of business power may be brought about. The young man may be put to work in some large factory at an early age and be expected to absorb the details of the business by virtue of his contact with them. Sometimes this plan produces a man of exceptional business ability, but far more often it results in his becoming a clerk, a mechanic, or a rule-of-thumb foreman. This failure arises partly from his lack of initiative and foresight. He may be ambitious, energetic and industrious, anxious for success, and in every way willing to do what seems to him necessary to become efficient; in other words, he may be naturally capable and in every way willing, but his ideals are almost always low. He does not understand what the requirements for a successful business career are and so does not take advantage of all his opportunities. Another reason for the failure is that he is usually working on a salary and his employer finds that his interest lies in keeping him at one particular line of work. Even if the employer takes an interest in the lad and by frequently changing his employment seeks to give him a general acquaintance with the business, he finds real progress difficult, for while the workmen with whom he comes in contact are able to tell him how to do things, they are usually not able to give him a reason for their methods, and so he goes on accumulating methods and rules which are available in particular instances, but is largely left in ignorance of the underlying principles which would enable him to vary these methods to meet new conditions. The average young man who enters a manufactory at an early age never really comes to know his business, occasionally one reaches a fair control in middle life, and the exceptional one gains a good knowledge of its principles. It is an uphill road from start to finish.

I think you will agree with me when I say that all this could have been changed if the boy had first been taught the scientific principles which underlie all manufacturing processes and then placed under the care of men who not only know the most approved processes and the principles which underlie them, but are able to explain them in a way which the boy can understand. These men, whose sole business it is to instruct, attain a wide grasp of the principles of the business and great facility in imparting their knowledge rapidly and in devising laboratory exercises which will quickly give manual dexterity as well as brain power.

There is a notion abroad in the business world that educated men are apt to be impractical. The teachers are themselves largely to blame for this. Until recently most teachers believed that the acquirement of an education was essentially a course in mental gymnastics and they had arranged a series of exercises in mathematics, the classics, philosophy and kindred subjects which certainly did accomplish the object sought, but they fell into the error of maintaining that this was the best, or, as many insisted, the only series of exercises which would bring the desired results. They failed to recognize that it is the judiciously controlled exercise of a muscle or a faculty that gives it power, and not the particular piece of resistance to which its force is applied. The result was that the students came from college really powerful mental engines but with no belt to connect them with the machinery of the business world, and hence they drifted into the so-called "learned professions."

Within the last fifty years a new idea has been gaining ground with the educators of this country. The demand that young men shall become men of affairs before they have hardly reached physical maturity, has made our educators feel that they must devise other exercises equally effective with those formerly used in developing mental power, and which shall at the same time bring to the student familiarity with the practical problems of the business world. This idea has taken the form of a demand which the educational world has been and is trying to meet, and the result is seen in the constantly increasing attendance at the schools in which these lines of work are being developed. This new idea has only recently invaded the precincts of the clayworking fraternity.

Until recently many ceramists seemed to believe that the surest road to success in their business lay in the development of secret and well guarded formulas and so far as possible keeping all knowledge of their processes from the world. These manufacturers naturally did not look with favor upon the introduction of schools whose declared purpose was to give their students, as a part of a liberal education, the best formulas and best methods which could be obtained; and not only this, but to give them as well the ability to develop formulas and processes for themselves which were better than any then in use because based on scientific principles and hence more easily controlled and more readily varied to meet changing conditions.

To Prof. Orton of Ohio belongs the credit of making the first breach in this Chinese wall of exclusiveness and, although for years he had serious difficulties to overcome, the recent rapid growth of his school and the readiness with which his graduates find lucrative positions prove that the workers in clay are beginning to recognize the correctness of his point of view. I earnestly hope that the good work he started may go on, and that the spirit of the schools may come to pervade the individual workers and their associations until the annual meetings shall be looked upon as clearing houses to which each worker shall bring the results of his year's work and receive in return his share of the world's progress in his art.

Since the surest and safest road to success for the future ceramist lies through some school which is especially equipped to meet his wants, I come before you to-day to plead his cause and to urge *that you give the boys a chance*. It is your duty to give them the best preparation which lies within your reach for their life work, and if you can place them where at twenty-five (this is intended to include two or three years of practical work after graduation) they will have a more thorough knowledge of the ceramic industry than they fathers had at fifty, what better investment could you make for them?

The University of Illinois offers your son the best resources it can command in his line. The State has used your money for the organization and equipment of the school. It will continue to use your money for its support. It is to be hoped that you will make the best possible use of the investment.

The School wishes to do more than offer instruction. We believe that our equipment and our relations with the other departments of the University will enable us to solve many problems which could not be readily worked out by the owner of a plant, and we wish to keep ourselves continually employed upon problems of this kind which are of general interest. It would obviously be improper for us to expend any considerable amount of time or money upon local matters which would benefit only one or two firms, but we shall be glad to receive suggestions as to problems whose solution would be generally helpful and we will always give them careful consideration.

We believe it to be part of our duty to gather information in regard to clayworking from all sources and to disseminate such as would be of general interest. For this purpose we shall issue bulletins from time to time and we hope you will find them helpful.

Now, gentlemen, I hope the future will prove that in the inauguration of this movement we have taken a long step in advance, one that will be useful and helpful to many interests besides the clayworkers'.

Please remember that this movement is yours as well as ours. It is a sort of partnership whose terms, as agreed upon last winter, are that you are to induce each Legislature to supply the funds necessary to carry on the work which is agreed upon by the joint action of your advisory committee and the University and we are to carry out the plans so made. In this way each will have a voice as to what is to be done and a part in its execution. It seems to me that the movement must have a bright future if all interested parties are as willing to bear their part as are those connected with the University.

W. D. Gates: I do not know what the proper method of appointment of this committee on Clayworking School is, but I presume ordinarily it is a matter that will come up at some future time. However, if it is proper at this time, I would like to make the motion that this same committee be continued for the next year. They have learned the ways of the Governor's office, they know the best chairs in the ante-room, and they have found out the addresses of the coal men. I don't mean that their re-appointment should be construed as a reward to pay them off; that is only in the way of a slight recognition of what they have done.

Mr. Gates' motion to have the present committee on Clayworking School continued for another year, having been duly seconded by Mr. H. de Joannis, was submitted to the meeting and carried in the affirmative without dissent.

President Stipes: I think Brother Gates is a little bit swift, and if there is any way on earth of getting him on that committee I wish it could be done.

Mr. Butterworth: The committee may be enlarged. It may be enlarged to take in the entire membership of the Illinois Clay Workers' Association. I make a motion that Mr. W. D. Gates be made chairman of that committee.

Mr. de Joannis: I second that motion.

The motion that Mr. W. D. Gates be added to the Committee on Clayworking Schools (sometimes called the Legislative Committee), duly made and seconded as above, was submitted to the meeting and carried in the affirmative.

President Stipes: Now, let us get back to the subject of Professor Rolfe's paper upon some ways in which the University offers to help the clayworker. Dr. Converse, you ought to say something on this.

Dr. A. L. Converse: I want to say this: The study of ceramics is probably a new study to the majority of us. But I have come to the conclusion that a great many have arrived at, and that is, that when scientific men say that a thing is so, it is not very good judgment on our part to argue with them. I say that, because I know that scientific researches in every direction are proving to the world that many things that might long ago have been brought to light and used for the advancement of civilization and the improvement of mankind have been neglected for want of the spirit of proper investigation. There are many things that we are so familiar with that perhaps on account of that very familiarity we know little about; and I predict that the work of this institution in the direction of our industry will not only help us to put money in our pockets, but it will develop the resources of the State of Illinois in a direction and to an extent that will be a wonder to the mass of the people. It is going to be not only in the interest of agriculture, or in the interest of the architects and builders, but in the general interests of mankind, in the interests of those branches of science and art of which we stand greatly in need today; and we will be able to instruct, under the help we receive from that institution, in a way that we never thought of before.

I have it in view for no one in my family—I have no boys. But there are thousands of young men in the State of Illinois who will be glad of the opportunity that is going to be given them of informing themselves on this important subject, and the result will be to add greatly to the wealth of the State and the country at large, besides contributing luxury which is beyond all conception.

Now, Mr. Butterworth, I don't think that your suggestion to include all the membership of our Association upon the Committee

on Clayworking School was made so much in a spirit of levity as that you meant that the bulk of the clayworking fraternity should cooperate as if they all belonged to a committee having for its object the promotion of these ends. If you did, it was but a piece of inspiration that was thus given to you to make a suggestion that was in exactly the right direction. I think, gentlemen, that we ought all to be thoroughly wide awake to the importance of this subject—so wide awake that we will keep our eye on this University, and be ready with such aid and suggestions as we may be able to provide, and from them we will from time to time ourselves have aid in the direction in which we most need help. They cannot get all the help that is needful now. But what will be the crowning help for them and for all of us will be the results of their work.

Now, I am not going to talk much on this subject; but I do want to ask that the labor which has been begun in a small way may be continued and made to develop the great results anticipated by the spirit in which it was undertaken. (Applause.)

Mr. Butterworth: What I said was not intended to be said in a spirit of levity, though it might have given that impression. The Legislative Committee want every member of this Association to become a party in this matter—every member of the Association to be a member of the Legislative Committee—because we certainly need the help of every clay worker in the State of Illinois, not only to get what we want from the Legislature, but in every way to talk up the University and induce students to attend and take up this course of ceramics.

I gather from Professor Rolfe's remarks—and we have talked it over a great deal—that this is going to be essentially a practical course; it must be scientific, of course, with lots of theory, and yet graduates from this course are meant to be ready to take up the practical work of a clay worker. Am I not right, Professor Rolfe?

Professor Rolfe: We don't expect to just turn them out as immediate workers in the clay-working industries; but we do expect to put the student in the position that with a very short residence as a worker in some first class establishment he will be in a position to be a practical worker.

Mr. Butterworth: That is just what I wished to bring out: That this school is just as nearly practical as a school of ceramics can be. I think the National Association appropriates two hundred and fifty dollars a year. With that amount we could get a paper from an authority that would be simply invaluable, something we would be glad to get no matter what the material from which it was taken—and at an outlay only to the extent of \$250.

Now, the Legislative Committee has succeeded in getting for you \$5,000 a year, of which a large proportion need not be spent, but held in reserve. Now, if the National Association can do so much with \$250 a year, how much more can be done with \$5,000 a year?

Mr. Hammerschmidt: The actual amount allowed the members of this committee here is ridiculously small. Legislators are to be elected next fall, and thousands will be around asking for petitions under the new law. Now, we want something besides an allowance for our mere expenses. We want something that will help us along, and it makes a great deal of difference if you all help. And these legislators,—and some of them will be re-elected next fall—we want to call on them again, and solicit them to help keep this school going. If that is done, and you can help us to do it—if you all help—we can get them to increase the appropriation.

G. C. Stoll: To defray all the expenses of this committee at Springfield, I don't know where this appropriation is to come from. The proposition is to enlarge the plan of this committee. A member of this committee will have to have some money to spend—he will have to show that he is a "good fellow," and that will take a more liberal allowance for expenditure for which we ought now to make some provision. What that provision ought to be—whether by increasing the dues from one dollar to two, or three, or by some other means, should be determined at this meeting. It is something that ought to be done, and done now, so that the money may be available.

Dr. Converse: I want to say one word in that connection: I have had a good deal of experience, and if there is anything that I feel strongly on, it is on that. If you have a measure that is of no account, an "axe to grind" for an individual, and you have the money with which to work, you will find plenty of "grafters" who want the work and will even beg it of you. But I want to say to you, and I speak from a legislative experience of over thirty years—

Mr. Hammerschmidt: You don't look it.

Dr. Converse: With the Legislature of the State of Illinois—you can go down to that Legislature in a patriotic spirit, with something good for the State of Illinois and something in which the people and the lawmakers of Illinois should be alike interested,—and I have never known them, have never known that sort of a committee to get any men to help them. Now, gentlemen, I know I am right. I know that if that Legislative Committee last year had had more financial means at their command and had not been troubled with any scruples as to their manner of expending them,—well, there has already been some intimation here as to probable results.

Now, the difficulties encountered by our committee were very natural ones. It was very hard to keep them together. At their meetings other subjects than the one for which they were appointed would come up.

I want to say for the committee that both the House and Senate treated us with great courtesy, gave us an opportunity to be heard at the earliest possible moment, and I had an opportunity to talk with a great many legislators on a great many subjects. And I want to tell you, as a member of that committee, that the Governor was accessible just the moment it was possible for him to see us; and, greatly to my surprise, they talked as intelligently upon this subject as any man on this floor has talked today. It was not a new subject to them at all. The Governor was well with us. But let any of us undertake to force a measure which has the appearance upon it that money is to be gained by it, and you will find plenty of "grafters" who will be reaching out for it. Honest, legitimate business, as regards the Legislature of Illinois—and other Legislatures are the same—cannot be brought before them without money in any sort of way. The members of this committee have referred to this in a joking way; but, gentlemen, it is money that is the object. The subject is full of sound, common sense. To get in without money is as impracticable as to get a wedge in where somebody else has a wedge in at the same time.

Mr. Stoll: I don't want to be misunderstood. If we don't make some sort of appropriation for the members of our committee to go down there, they will have to pay their own expenses. If we do give them money for their expenses down there, it will be for their legitimate expenses, as railroad and carfare, board, etc., that is what I mean. I didn't mean that anything should be given to the legislators. It was to defray their legitimate expenses, and they themselves understand it in this way.

Mr. W. D. Gates: Perhaps it is on my account that this increased appropriation is asked—it was to help me out; and I will not say much about it, only to *rivet* what Mr. Hammerschmidt has said if possible. And my experience with the legislator has been that the one thing that appeals to him is the question of the vote; and I think we should remember what Mr. Hammerschmidt has said—and let us hammer that into all the members of this meeting—that we must keep after our legislators. If we neglect that, that is, to hammer it right into them and let them know that something will be doing or they will not be re-elected,—if we neglect that it will be a very important omission.

Mr. Butterworth: I would like to take back anything I may have said in my report here regarding the use of money by the committee, which certainly must have been understood,—that part of it which it might be possible to misconstrue,—was said in a joking way. And I would like to say right now, before the Legislative Committee, that on the whole we were treated in Springfield in the best way possible. I remember very distinctly that the Governor postponed consideration of a letter for an hour and a

half so that he could finish a discussion with us when it came up. I would not have construed his conduct for a minute as leading us to feel otherwise than that we had been accorded by the Governor every consideration and courtesy.

President Stipes: I think, Mr. Butterworth, that most everyone understood that, unless it was, perhaps, the Doctor. I think, gentlemen, that Mr. Butterworth wanted to impress upon you the fact of our inexperience (I will except the doctor, and in speaking of inexperience I will say that for my own part it was my *first* experience), and he did not intend to convey the idea that the committee had not been well and properly received with all due consideration and courtesy at Springfield.

Now, as far as the Legislature is concerned, I don't think that the Legislature got any of that money; in fact, I think the railroads and hotels got it all. That is my experience.

Dr. Converse: Yes, there is. Now, gentlemen, I can take a joke as well as anybody, I think. Such things as this continual harping and joking on subjects of that kind lead the average man to believe that they are genuine. Now, I will tell you how genuine they are: I have the applications—and some of the rest of you had, I know some of them had,—for a measure the passing through of which footed up a bill amounting to twelve hundred dollars that was expended in the Legislature at the last session for business that did not require twelve hundred cents. You will find people ready to take what you have, if you have it to offer. But it is the idea of the average business man, that the only way to get an enterprise through is to back it up with money. We have an awful reputation in this country—that all of our officials are "grafters" who are reaching out for what they are not entitled to.

Now, there are some lines along which it is not good policy to joke, and if we do want to do a little joking on these doubtful subjects, it is always well to explain ourselves before we get through, because it is not everyone who can see through a joke. I was not attacking the report, or even making any reflections upon it, but simply wanted it understood that the Legislature of Illinois is composed of gentlemen and rascals, and that the majority of them are honest; and ten good, honest, upright men in that Legislature can take hold of honest legislation and put it through regardless of the rascals—now, that is true. (Applause.) But some people, having had no experience in that line, seem to think that they must first be approached with money or something to give. Now, that is all wrong. It is not the right way to go about it. We have something here that is not a "white elephant." And when a man shows he has something requiring patriotism, even without money or other consideration, he will find representatives of this State who will fall over each other to meet that requirement. (Applause.)

President Stipes: Professor Rolfe, do you want a committee to look out for this free scholarship?

Professor Rolfe: Mr. Chairman, the Board of Trustees of the University have offered me a scholarship for each county. They said that these scholarships should be awarded on the nomination of the Association. It was called to my attention the other day that it had been left entirely undecided as to what that meant. The Registrar of the University asked me if that meant that any member of the Association might nominate anybody he choose, or if it meant that it should be the work of the Association—the official work of the Association.

It seems to me that your Association should take action empowering some one, or some committee of more than one—it would be better, perhaps, to empower some *one*, as it would occasion less trouble—to make these nominations to the Registrar; or if any member of the Association has a nominee in mind, let him send the name to someone here who will make the nomination officially to the Registrar.

W. D. Gates: I nominate Mr. Stipes to act for the Association. He is right here in Champaign, and can attend to the business easily.

Dr. Converse: I have an objection to that motion. It has

occurred to me, and I believe the law has provided, that the choice shall be upon the recommendation of the Clay Workers' Association. Now, it seems to me that if we delegate the membership of the Association to each county,—whether one or more,—to nominate from that county, it could be much more intelligently done. For instance, I think if Mr. Stipes is simply authorized to make the nomination, could he possibly do for Sangamon County as well as some one familiar with the young men of that county and those who would like or desire to avail themselves of this opportunity? And what will hold good as to Sangamon County is true of any other county.

Now, it seems to me that a motion should be made in this way: that a member of this Association from each county be appointed, and that those members shall be authorized to nominate, in the name of this Association, candidates who will avail themselves of this offer. Thus we will get at the interior, and it will give us an opportunity of getting good and eligible young men for this purpose.

W. D. Gates: An objection I can see to the Doctor's suggestion is that we have not members from every county in the State, and Mr. Stipes can readily put himself in communication with members from that section and inform himself. I had no idea of having nominations made indiscriminately. If some one from an outlying county or from any county desires to be informed of the qualifications necessary he could communicate with Mr. Stipes.

Professor Rolfe: I am not in anyway opposed to the Doctor's motion, excepting as to the practical working of his plan. The Registrar of the University is not familiar with the members of the Clay Workers' Association throughout the State. If a party from Kendall County, for instance, should write him that he was a member of the Clay Workers' Association, the Registrar would hardly know whether that was an authentic communication or not.

My own idea of this is that if some man were appointed, or men, and given authority to make recommendations to the Registrar, and let the other people make their recommendations to them. Now, if you should appoint one, two, three or half a dozen men here to take charge of this matter, and Mr. "K" of Kendall County should write them here, they would at once know whether Mr. "K" had the authority to do that, whether he was a reliable man and whether the nomination ought to be taken.

It seems to me, then, that under the provision of which the Doctor has spoken already, this is the most advisable plan, to have the men of your Association whom you have chosen to have this matter in charge, receive recommendations from the members in different portions of the State, and have them make the nomination over to the Registrar.

I will say that I think it very proper to have this matter referred to a few men chosen to act for the Association, in the nature of a board—say, five of your best known members here who could have charge of this matter. I believe this is one of the duties which should properly devolve on such a board, and I move, as a substitute for Mr. Gates' motion, for the appointment of an advisory board to whom applications for scholarship could be referred.

Mr. Hammerschmidt: I move that the Secretary and President of this Association be appointed an advisory board, to have charge of this matter of the application for scholarship. The Secretary and President are well known to every member of the Association, and each of them knows all the members. It's easy for me to go to the Secretary here, for instance, and say that such and such a member wants to take a scholarship to the school. He would know me, and likewise would know the member with the scholar.

W. D. Gates: I would second that motion, if I thought that the Secretary and President could get together and act as an advisory board. Those gentlemen, themselves, are best informed as to the legality of their acting in this capacity, being officials of the organization.

Dr. Converse: Mr. Chairman, I see that there is merit in all the propositions discussed, and this, I think, is one of the best. However, I would suggest that a committee of three be appointed

to draft a sufficient resolution to cover this point, and present it tomorrow. Then, after having had an opportunity to reflect upon it, we can get it in shape. I think that that is the better way to do, and I move that such a committee be appointed.

Mr. de Joannis: I will second that motion.

The motion to appoint three members of the Association a committee to draft resolutions relating to the scholarship proffered by the University in the interest of the School of Ceramics, as explained by Professor C. W. Rolfe to the meeting, was duly submitted, and was carried in the affirmative.

President Stipes: Brother Gates has reminded me that I have a letter from the street railway people which I ought to have read at the start. I will read it now: (Reading.) "Mr. J. W. Stipes, Champaign, Illinois. The above company (the letter is written on one of the Street Railroad Company's letter-heads) wishes to extend the courtesies of city cars to the clay workers while they are in our city. If you will kindly send us a badge such as they will wear on this occasion, we will be glad to give the conductors proper instructions." The letter is signed by H. J. Pepper, General Superintendent. Now, gentlemen, all you have to do is to get on the cars and ride, and it will not cost you a cent.

(A vote of thanks to the street railroad company was unanimously accorded by the meeting.)

B. F. Roberts: I was asking Professor Rolfe if the young fellows that 'tend the furnaces, providing they are willing to devote the time to it, would be taken in at the University for three or four weeks, say, to learn how to make simple tests, and see whether they were good for anything or not. He says he is willing to do that if the men of this Association want it done, and I would like very much to have it discussed.

President Stipes: That is something that you all ought to be able to say something about.

J. M. Mamer: I think they should only be too glad to do it. But they cannot, and I, for one, would hardly be in favor of anything of that kind.

D. O. Loy: I am not able to say what could be done in that line. I want to say that I have lost money occasioned by not knowing clay from mud or clay from shale. I think I want my children and grand children to continue on in the line that I am in—I want them to be clay workers, and clay workers who will know something of their business so that they will not make the mistakes that I have been making all my life.

Mr. de Joannis: Do you mean to say that instruction can be conveyed by heredity, Mr. Loy?

Mr. Loy: No; I am a practical man—have been a brick-maker all my life. Yet, if I could go out to the University and watch the manipulation of mechanical and scientific instruments there, and observe the action in the furnaces, I feel that I could get some of the information of the kind that boys get who find time to spend four years at the University, and don't have to wait four years, until my boys are bringing out the same lots; and the consequence is that the little fellows are going to be handicapped, unless they have a chance to get a little knowledge of this sort in this way.

Prof. Rolfe: This thing has been going on among the farmers, exactly this same thing. The farmers' boys will come and stay two weeks—they ask to come, the boys, some of the younger men and some of the older ones, too—and they attend these exercises, say two weeks or more; they come there with the idea of doing nothing but that. But in the course of two or three weeks they see, often, that there is really something in it for them, and they come back ready to take a longer course. Of course a great many don't do that. There are many who come and remain only the two weeks or so, and they get a good deal of benefit out of their attendance at the exercises during that time,—and I don't know whether you people want this or not; if you do want it, I don't want to throw anything in the way.

Dr. Converse: This proposition, now, is one of the most practical that we have had. I think that it ought to be referred to some

committee—the same committee having in charge the preparation of those resolutions; and by the time we get these things sifted down we find ourselves able to act upon them with intelligence. We certainly ought to have the opportunity of viewing the practical workings of this institution placed prominently before the members of this convention here, so as to induce many to avail themselves of it. I move that this matter be left with the same committee to whom we have already assigned the duty of preparing resolutions relating to the scholarship.

(The motion was made and duly seconded, to refer the proposition to allow those desiring it to attend the special exercises at the School of Ceramics at the University for a few weeks, and having been duly submitted to meeting, was carried in the affirmative.)

President Stipes: I believe, gentlemen, that now is a very good time to appoint that committee; and I therefore appoint Dr. Converse, Professor Rolfe and Mr. Hammerschmidt.

President Stipes: I see we have on the program for discussion at this session of our meeting, first, Tile Drainage and Its Benefits; and, second, Which is Better, Deep or Shallow Drainage? Mr. Powell, can we hear from you on this subject?

J. M. Powell: I don't understand the subject.

President Stipes: Well, the first one is, Tile Drainage and Its Benefits, and the second, Which is Better, Deep or Shallow Drainage?

Mr. Powell: I believe I have said all I care to say on that subject.

President Stipes: We would like to hear something.

Mr. Powell: I don't think I care to say more.

J. M. Mamer: What I say may seem like going over the same ground again—a sort of re-hash. But I think there is one thing certain, that when it comes to deciding between deep or shallow drains, it will depend entirely upon the soil and the locality you are in.

Geo. F. Beardsley: Is the question now before the house Tile Drainage and Its Benefits?

President Stipes: Yes, sir.

Mr. Beardsley: It's a "free for all" subject, as it appears?

President Stipes: It is for general discussion. We like to hear from anyone.

Mr. Beardsley: I spent some time in the tile business, and it seems to me if I were to speak to one who knew nothing of tiles I could convince him in about three minutes it is a very important thing for a farmer to have about, and I would only have to relate one incident in my business. I sold to a man who lived eleven miles away from here some tile. He wanted to put them in, but couldn't pay for them till the next spring. We put them in in April. They had been in one year, when he came in the next spring to pay for his tile, after he had had one year's crop from his land after the putting in of those tile. He paid his bill, and I said, "Do you think it has paid you?" I asked him. "Paid me?" he said; "Mr. Beardsley, if I were compelled to go and dig them up and haul them away after having used them one year, I have gotten enough out of the use of those tile to pay me for hauling them all back again and replacing them." Of course that would not apply to all kinds of ground—you couldn't say that of every piece of land. This was a flat, wet locality, on which you could raise nothing of any account until after it had been drained by the tile; but he raised sufficient, enough and more than enough to pay him had he been compelled to dig them all up and replace them in his ground again.

It seemed to me when I saw that question on the program for discussion, "Drainage and Its Benefits," I had supposed that that thing had long since been "out-lawed," that it was no longer worth while to discuss that proposition; and even now, after discussing the question, I mistrust that I may not have heard right, and my feelings are as though I may have been arguing on the wrong subject all the while, and men sometimes, as well as the boys, when they make mistakes of that sort,—wander from the subject,—should be told to sit down, and I wouldn't have been at all sur-

prised if you had asked me to sit down. I would have done so, feeling like the boy in the school whom the teacher was licking for the misdemeanor of throwing paper wads—it's a story I heard John B. Gough relate as a diversion once when his pathos had moved two ladies in the front row to almost audible weeping,—the teacher was whaling the boy, and the boy laughed inordinately, and the teacher, applying his whip, said, "You dare to laugh, do you?" and the boy said, "Why, teacher, I laugh, I *have* to laugh, for you have been whipping the wrong boy." So, if I have been "whipping the wrong boy" all this time, it's my mistake and the laugh is on me; for, honestly, I did not suppose that that question would ever come up for discussion anyhow.

President Stipes: Mr. Wheat, I believe you are an advocate of *shallow* drainage?

G. G. Wheat: I don't know anything about drainage whatever, from experience. I am absolutely a learner in this business. I had a discussion with Mr. Hartwell some time ago, about draining some of our ponds. The "Wise Men of the East" had been down our way to teach us drainage. Some farmers had come out from Illinois, and buying some of our flat lands at from four to six dollars an acre, had made them worth a hundred dollars an acre; and we are just beginning to do what you have been doing here in Illinois for years. And there are two or three questions, some points upon which I would like to ask a question or two, if I may.

Ordinarily, we have two or three feet of black soil, and under that, hard-pan, as the telephone men call it, which is impervious to water, or seems to be. Now, if the tile is laid underneath this hard-pan, say at a depth of four or five feet, as soon as the soil is repacked in the ditch, we might as well have no drainage there at all; unless, as some have done, we put in wells; and a well will drain a limited area. I would like to ask the question if there is any other known way of draining under these conditions—than the use of wells?

J. M. Mamer: Instead of a well, I would go to work and run laterals off from the main instead of running off the surface. I believe that would have better results. I don't know, however, of any similar circumstances in this State.

G. G. Wheat: Our farmers have to lay the tile deep, otherwise they would be subject to frost, and they couldn't stand the frost. They are laid deep down below the influence of the frost. Of course tile that is water-soaked and then frozen, frozen while filled with water, will not hold out very long. As to the suggestion about running laterals from the main line, that I believe has never been tried; you must know that our farmers down there don't know very much about tiling, and the tiling question has been held back to some extent. But there has been a great deal of tiling done in some places, and some have tried it whose ground has not been as well drained as they had anticipated it would be by this means, and they have jumped to the conclusion that they could not tile that sort of ground.

J. M. Mamer: I remember the case of a neighbor of ours, twenty years ago. He took hold on the theoretical side of tile laying readily enough, was much raken with it; and he had his land tiled—the tile laid down, I think, about thirty-six inches below the surface. He went down onto his farm one day after a rain, and found a low place where the water stood just as though there were no tile there. He went to the house and got a spade, and walked out through the water which he found to lie about six inches deep; and he pushed the spade well down through the soil, and soon the water was all gone. It seems that there was something down there that was impervious to water, and the water would not run through it. We have a district, a small tract up in our town that was hard-panned underneath; and tile was laid there—not perhaps over twenty or forty feet apart. The first year the tile did no good; the second year it did a little better; the third year still better, and now it is a great success. It seems that this tile, for a while, was in that condition—I don't know the exact condition—that it could not at first perform its function, but whatever that condition was, it only required the lapse of time to

remove it. Watch the history of tile from the time of its first introduction in a given locality, and note results. Property that seems not to have received much benefit at first is the very piece that will be observed to be most benefited after a few years' drain-tile treatment. The tile will be found to work better the second year, after having worked very little the first—still better the third year, and so on.

Ross C. Purdy: I want to make a suggestion. Dr. Bain, formerly of the Iowa Geological Survey, is here, and on this question of what depth in the soil should drain-pipe be laid, I think we would be glad to hear from him.

Mr. Bain: I presume all sorts of things are under discussion here: Just what it is that is up now I have had no time for preparation upon, but I gather that it has relation to the problem of the depth at which tile should be laid with the most profit accruing from its service in draining water from the soil.

Now, with reference to the difficulties that have just been under discussion here, I think they will be found to have arisen from the clay having settled down and solidified above the tile; and all it requires, I think, is to be loosened—opened up—simply opened up. Now, it is possible that it would of itself break up in time; but the object is to reap the profits of the tile laying without having to wait the tedious process of years—this gradual breaking up of the soil above the tile. And when you put in your tile, and find you have not the desired effect, don't wait for a series of years to accomplish what a little loosening of the soil will do for you, a separation of the particles, letting the water through and obviating and avoiding flood. Find some process to cause the water to settle—get it cleared from the soil quickly, by the process which requires the least time.

Mr. Hammerschmidt: I would suggest to this gentleman to put his tile down deep, and then fill his ditch full with cobblestones or anything of that character—fill it up to the surface, and in the course of one or two years all will work well.

James Luther: Mr. President, I am almost afraid to say anything for fear some of my friends will think I am trying to advertise my business; but I would be willing to ship a carload of tile under a guarantee that it will last fifty years. I think if burned properly tile, when placed in the ground to a depth of two, three or four feet—whatever depth it may be laid—if well burned it will last a thousand years and not crumble.

Dr. Converse: A gentleman came to my office some few years ago. He had bought some land for a song, almost, and while there were some conditions that looked unpromising, I thought from his description of it that it certainly in some way might be made valuable. He wanted me to make an investigation, and finally I concluded to do it. I made the investigation, and found hard-pan within ten or twelve inches of the surface, and while there was a little soil upon it, it was very moist, and the atmosphere, though, was favorable. The difficulty was, the land was of no real value. After talking with one or two men, neighbors of his, I became convinced that I was right in my conclusions. I don't believe that that kind of land is going to be improved in any other way than by surface drainage. I would not go to the expense of putting in tile. I don't think that that land, even if properly tilled, is sufficiently porous to admit of the tile carrying off the water effectually.

President Stipes: Gentlemen, for your benefit, I think, the University of Illinois is putting through quite an experiment with land of that kind down in the southern part of this State. Professor Rolfe, do you know anything about what the University has been doing in the southern part of the State with hard-pan?

Professor Rolfe: I believe that any land can be successfully tilled, notwithstanding hard-pan—"hard-pan," that much used word. Everyone, perhaps, does not know that the hard-pan of one section is not the hard-pan of another. I should judge that the hard-pan the member has talked about here is exceedingly dense, closely packed clay, so fine grained, possibly, as to be practically waterproof, so that water cannot get through it. If this is the kind of

hard-pan he is talking about, and that is what is being investigated in some parts of southern Illinois—it is found that that is just the sort of soil that tile will make porous after a time. There is where they need tile. Begin tile-laying in a small way. It will pay for itself, even the first year. Then, after tile has been in four or five years, the area having been widened and the tile laid deeper in the soil, the effects become more and more apparent, so that it is possible to determine the position of the tile below the surface by the character of the soil above. The untilled soil in the southern part of our State is damp to such a degree that it is hardly possible for a man to walk across his field. These conditions change under the influence of tile drainage, and the area of improved soil becomes wider and wider as the tile laying progresses. I have met men who have had experience such as the gentleman relates with regard to the impervious qualities of the hard pan; and where these conditions prevail, the tile should be first laid with but a short distance between, then increased, as the effect on the soil becomes apparent.

During the glacial period of this country, there was a bold depression formed, and the water collecting there, running naturally toward this basin, the finest particles of clay were carried by the water and deposited there, which formed this impervious bottom. Now, it is tile-laying that is breaking this up—it has been doing it, and is doing it every day. (Applause.)

D. E. Morey: Very well answered. While I am a western man—not a western land agent—I can appreciate this subject of drainage, although the problem confronting us western people, that is, the reduction of the water level in the alkali regions outside of the Dakotas, may appear to be in some degree related, yet I am not aware that these lands stand in particular need of extensive drainage, at least I have not heard of it. It is a subject I know nothing about. Yet, if there is a way to run off the water from these alkali beds and make them suitable for the needs of agriculture and the production of crops, the tile theory I have heard discussed here would certainly appear feasible.

These alkali grounds grow certain kinds of grass. Some of the land has been sold as farms, and it is a question whether the application of tile drainage to them would be practicable or advantageous.

The meeting was adjourned at 5:20 p. m. to the second session, called for Wednesday morning, Jan. 24th.

OHIO RIVER SEWER PIPE PLANTS BUSY.

The Myers Fire Clay Co., of Toronto, O., the big independent sewer pipe manufactory, is still working full handed and will continue to do so throughout the winter months.

They have many large orders ahead which will keep the wheels turning steadily.

The Nicholson brick works, of Toronto, and the Minor works at Freeman's are both running, giving employment to many men.

The Stratton Brothers, of Empire, the largest independent sewer pipe manufacturers in this section, are running both the Ohio River and Stratton Fire Clay plants night and day and will continue to do so from present indications. They have been making sewer pipe twenty years and have yet their first time to close down. During the past year they run their plants 365 days. No work was done on Sunday, but the factories were operated nights, making the equivalent of every day on the calendar.

The new Great Northern works at Stratton, the new town above Empire, is rapidly nearing completion and will be in operation in less than 30 days.

**600 TO THE ANNUAL POW-WOW OF THE
JOHN B. ROSE CO. OF NEW YORK TO
HUDSON RIVER BRICK
MANUFACTURERS.**

The John B. Rose Company, whose offices and wharves are at the foot of 52nd street, North River, New York, demonstrated that it is quite possible to successfully combine business with pleasure. Immediately following their meeting they tendered a luncheon to the manufacturers, dealers in masons' building materials, builders and their friends, at the Murray Hill Lyceum, Thirty-fourth street. Six hundred guests were present, among whom were Horatio N. Woods, president of the National Bank of Haverstraw, with his partner, Brewster J. Allison; Mr. Everett Fowler, president of People's Bank of Haverstraw, with his partner in the Excelsior Brick Company; Mr. A. S. Staples, president of the Ulster County Savings Bank, Kingston, N. Y.; Jonathan D. Wilson, Newburgh, N. Y., Assemblyman W. Graham and many others prominent in political and business life.

The annual blow-out of the John B. Rose Company has become widely known as the "Hot Air Convention." By way of explanation as to the significance of the name, it is learned that when the hosts, the John B. Rose Company, issued their prospectus in September, 1902, they promised certain reforms. Their competitors immediately cried "hot air" and dubbed them "The Hot Air Concern." Realizing the value of a pat expression, the John B. Rose Company seized upon this, and at their first annual dinner, in January, 1904, souvenirs were issued in the form of an attractive button bearing the date, name of the company, and the words "Hot Air." The assembly immediately became known as the "Hot Air Convention."

So popular have these gatherings become that the company found itself with five hundred guests at the second annual dinner, January 19, 1905. Here souvenir buttons, with the date and name of the company as before, proclaimed to the public that "Hot air cuts ice." Considerable speculation was indulged in as to what expression the company would hit upon this time, and there was much merriment when the buttons were passed out reading "The John B. Rose Company, 1906. Hot Air. What's Hotter?"

The hall was profusely decorated. At the very outset everybody became thoroughly imbued with the spirit of the occasion, and for five hours were enjoyably entertained. The menu was served by L. L. Goldstein, proprietor of the Murray Hill Lyceum, and was an extensive one. During the luncheon Hurtig & Seamon's orchestra of twelve pieces played popular airs. Not infrequently the entire assembly, led by a double quartette, composed of former members of the Yale Glee Club, old friends of Mr. Rose, joined in the chorus. At the conclusion of the luncheon the tables were cleared and a vaudeville program under the direction of Harry J. Seamon entertained the guests.

At the meeting of the manufacturers preceding the Pow Wow representatives were present from the Hudson Valley, Hackensack and Connecticut. The reports of the business for the past year were read, and the general conditions of the trade were discussed. Only the brickmakers attended this meeting. An address which described brick trade conditions very tersely was delivered by Mr. John B. Rose, president of the John B. Rose Company. Mr. Rose said in part:

"A year ago we met here quite satisfied with the year that had passed, and hopeful, if not almost confident of the future. Today we meet after the most successful year in the history of the brick business. Not for twenty years have the prices been so high, and never in the history of the business have so many brick been produced. Representa-

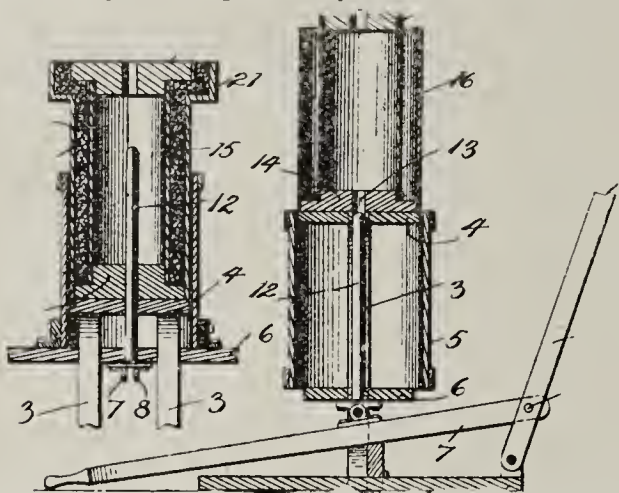
tives of this company have for weeks been at work preparing an inventory of brick on hand at the close of navigation and a comparative statement of the brick manufactured during the past years. Six years ago the manufacturers found themselves face to face with extermination unless the ruinous competition and low prices which then prevailed could be remedied. For the purpose of bettering these conditions an association was formed which had that for its sole object, and for a number of years the output of manufacturers was reduced from over one thousand millions to seven hundred and fifty million brick annually. Thus the great surplus which was found in the various yards at the close of the season was gradually reduced, until last year we found that the supply of brick of that season's manufacture, which must last until the brick of the following year's manufacture should become plentiful, about the middle of June, was scarcely enough to keep pace with the demand. With the reduction of brick manufactured annually, and consequently the constantly decreasing surplus at the end of the manufacturing season, came a gradual increase in the demand. To this demand alone are due the high prices of today. Not since 1902 has anything been done to secure a curtailment, but manufacturers, fearful lest the conditions which obtained before 1901 might again come to pass, of their own accord were not eager to drive their work. But during the past two years, when the users of brick in this city have been loudly proclaiming that the brick trust was forcing up the price of brick, there has been no combination, and we have made all the brick we could produce. From the most careful estimates we have been able to make, the increase in the manufacture has grown from seven hundred and fifty millions in 1904 to eleven hundred millions in 1904, and twelve hundred and fifty millions in 1905. This does not take into account the large number of brick that come into this market from Connecticut, Troy, Albany and from South River, N. J. It includes only the brick manufactured on the Hudson river from Coeymans, south, and those shipped to this market from Hackensack, N. J. The stock of brick on hand at the close of navigation in 1904 was two hundred fourteen millions, nine hundred and forty-one thousand. With an increase of over two hundred millions manufactured in 1905 and with a still larger quantity coming into the market from New England, we find the stock on hand to be two hundred millions today, with navigation still open to Haverstraw, showing that the great demand for brick has exceeded the enormous production of twelve hundred and fifty millions. How then in the name of all that is good and bad can the users of brick in this city yell 'brick trust?' For, notwithstanding the fact that we have done our utmost to produce all the brick possible the demand has gone us still one better. There is just one other point I wish to make at this time and that is, dealers have told us that the high prices of brick may discourage builders. To this I have made the following reply, and am sure you will all bear me out in the truth of it. If builders wait until the price of brick prevents them from building they will never stop. So small a part does brick play in the cost of a modern building, that an operation consuming one million brick today and the ground covered, would represent an investment of one million dollars. Do you imagine that even so great an advance as \$5 per thousand on the price of brick, which would represent an additional cost of \$5,000 on a million dollar investment, would prevent the owner from going on with the work? In the case of a building where two hundred and fifty thousand brick would be used in construction, the same conditions would apply. Let us now, and for all time to come, disabuse the minds of the users that there is a combination of brick manufacturers, for a willing purchaser makes a better market than an unwilling one."

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

806,633. Tile-making Machine. Loron O. Burnham, Clare, Mich. Filed March 11, 1905. Serial No. 249,616.

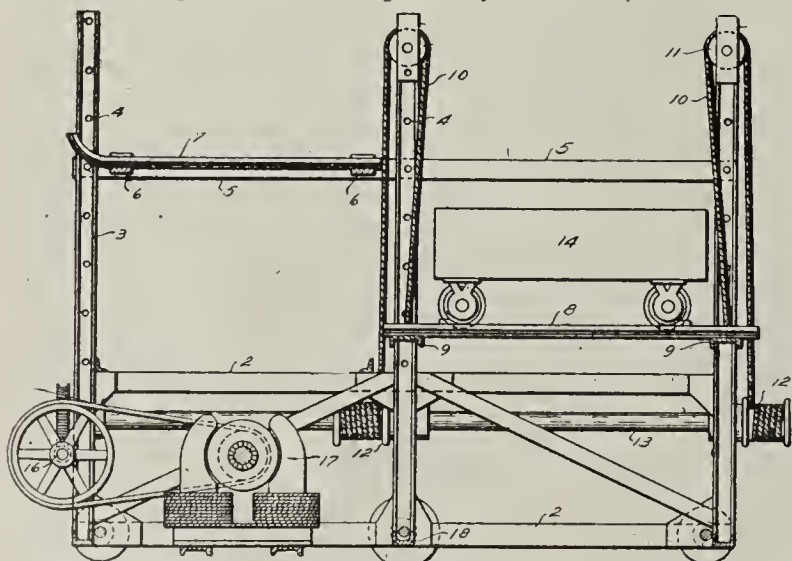
Claim.—The herein-described molding-machine for plastic material whereby the same may be held temporarily until set or partially dry, comprising a suitable supporting-base; standards carried by said base; an exterior housing or casing 5; a controlling-lever operatively connected to said housing;



a table mounted on said standards; a centering device 12 carried by the bottom of said housing; an auxiliary lever 10 co-operating with the controlling-lever and suitable collapsible molds adapted to rest upon said table and receive said centering device whereby when the controlling-lever is elevated the housing will be brought to surround said molding appliances and secure them in their operative position; all combined substantially as specified and for the purpose set forth.

806,765. Portable Brick-elevator. Frederick A. Bach, Chicago, Ill. Filed Apr. 10, 1905. Serial No. 254,743.

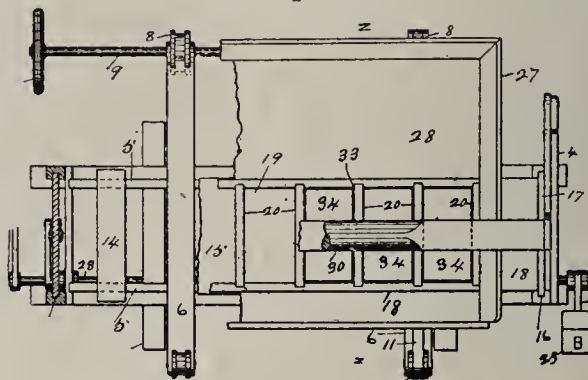
Claim.—The combination of a portable frame, wheels supporting said frame, a horizontally-disposed platform adjustable to fixed positions at a plurality of different levels in



said frame, a second horizontal platform mounted to move vertically in said frame, a pair of tracks on each side of said platforms for supporting a car, said tracks being adapted to be brought into alignment with each other to permit a car to be run from one platform to the other when said platforms are at the same level, four cables secured directly to the corners of said second platform, sheaves at the upper part of said frame for said cables, drums engaging said cables for raising and lowering said second platform and worm-gearing for simultaneously driving said drums.

806,927. Cement Block and Brick Machine. Taylor F. Shoemaker, Bluffton, Ind. Filed Apr. 10, 1905. Serial No. 254,806.

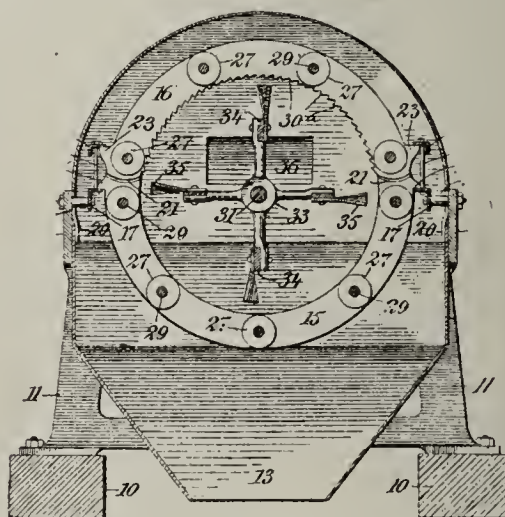
Claim.—In a cement-block machine, an upright supporting-frame; horizontal bars arranged transversely of said frame with rotatable pulleys mounted on the opposite ends of each bar; an endless belt passing over the pulleys of each of said bars provided with means for engaging with a pallet supported on said belt; a pallet mounted on said carrier-



belts and transverse bars in said frame; a mold vertically adjustable relatively to said pallet and arrange in co-operative relation therewith; (bifurcated) vertical standards slidably mounted in grooves in the inner faces of upright standards at each end of the machine, and secured at their upper ends to the mold-box; duplicate operating-rods pivotally connected at their upper ends with bifurcated standards and at their lower ends pivotally connected to one end of a lever whose other end is rigidly mounted upon a rotatable horizontal shaft; an upright operating lever connected with said rotatable horizontal shaft to elevate and lower the said standards supporting said molding-box; and means for actuating the carriers to remove the loaded pallet from beneath the mold when elevated.

807,136. Pulverizer. Nickolas Spurgin, Ottawa, Ill., assignor of one-half to Benjamin B. Holland, Ottawa, Ill. Filed Sept. 3, 1904. Serial No. 223,259.

Claim.—In a pulverizer, the combination with a chamber comprising spaced rings provided with internal teeth, of a beater having inclined blades and being rotatable within the chamber.

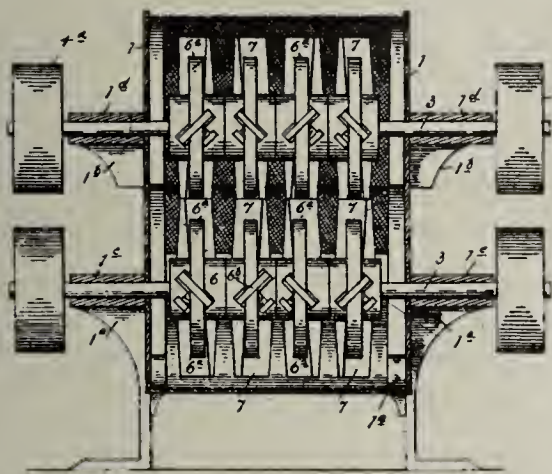


In a pulverizer, the combination with a chamber comprising a series of rings, each of which has at one side a straight face and at the opposite side a tapered face, of bosses projecting from the tapered faces to the plane of the body of the ring and having openings, tie-rods extending through the openings, and a beater rotatable within the chamber.

12,418. Pulverizer. James W. Boileau, Detroit, Mich., assignor to Louis C. Sherwood, trustee, Detroit, Mich. Filed Nov. 21, 1904. Serial No. 233,745. Original No. 764,268, dated July 5, 1904.

Claim.—A pulverizer-wheel comprising a disk having radial blades extending from a point near the hub thereof and projecting obliquely on each side of the disk, said blades having their obliquity alternately reversed.

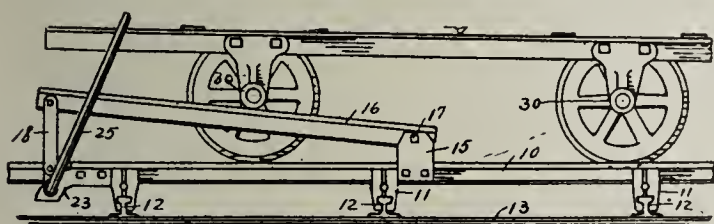
A pulverizer comprising a plurality of shafts, each shaft having mounted thereon a series of pulverizing-wheels, each wheel consisting of a disk provided with radial openings extending obliquely through the disk in opposite directions alternately at an angle of approximately forty-five degrees to the plane of the disk and ninety degrees to each other,



blades removably secured within the openings with their inner ends approaching the hub and with their outer ends extending beyond the periphery of the disk, the blades of adjoining wheels in each series disposed at approximately ninety degrees to each other so as to present a zigzag line of pulverizing edges as viewed lengthwise of the series, the several shafts so relatively arranged parallel that the periphery of one series of wheels will not intermesh with the periphery of another series.

806,147. Means for Stopping Cars. William P. Hussey, Indianapolis, Ind., assignor to Standard Dry Kiln Company, Indianapolis, Ind., a Corporation of Indiana. Filed July 31, 1905. Serial No. 272,054.

Claim.—The combination with a railway-track and a car adapted to run thereon, of wheel-housings extending down from each side of the frame thereof, a bearing-plate secured to the outer side of each rail, a stop-bar with the end next to



the approach of the car pivoted to said bearing-plate at each side of the track, a connecting-bar pivotally mounted at the other end of each of said stop-bars, a crank-shaft for elevating and lowering the connecting-bars at both sides of the track, and a hand-lever for actuating said crank-shaft whereby said stop-bars may be inclined in position to engage the housings of a car.

SHIPPING ROOFING TILE TO COLON.

A cargo consisting of 3,200 crates of tiles was shipped by sailing vessel from Darien, Ga., to Colon, being the second cargo of the kind shipped within thirty days. The tiles are intended for government buildings in connection with canal work and are the output of the Ludovici Roofing Tile Co., whose offices are in Chicago and New Orleans.

CLAY WORKING INDUSTRIES IN 1905.

In reviewing the progress made by the clay-working industries in 1905, Mr. Jefferson Middleton, of the United States Geological Survey, notes that the year was unusually prosperous. There has never been greater activity in building.

BRICK.

In nearly every large city in the United States the demand for structure material, especially brick, was greater than the supply. In Greater New York the enormous consumption of brick drove the price up to \$10 a thousand for common brick during the height of the season. What this means will be better understood when it is stated that only a few years ago brick of the same grade sold for less than half this price. Other great cities also consumed unusually large amounts of building brick, though strikes in some of them, notably the teamsters' strike in Chicago, interfered to some extent with the building trades. As a result of the immense consumption of brick in New York, the output of brick along the Hudson River, in both New York and New Jersey, was the largest ever recorded. The same stimulus was felt at points in Connecticut and Massachusetts, as well as at points in New Jersey some distance from the Hudson River.

During the year the paving brick industry was in a flourishing condition, and returns will show a notable increase over the business of 1904. Brick pavement seems to be growing more popular in the smaller cities, and as the proper method of laying it is becoming better understood there is no reason why it should not prove entirely satisfactory.

The use of face or front brick seems to be increasing. This kind of brick is used now instead of stone on many of the largest buildings.

The output of fire brick naturally reflects the condition of the iron and steel industries, and as these were phenomenally prosperous in 1905, it may be expected that the production of fire brick in that year will show a large increase over that of 1904.

POTTERY

The pottery industry thrived during 1905. The price agreement was broken early in the year and caused some disturbance in the industry, but by the end of the year matters had so adjusted themselves that normal conditions prevailed. It is the general impression among producers that the product for 1905 will be greater than that for 1904, but that the value of the output will be about the same. The imports of pottery during 1905 will probably show a falling off, possibly explained by the fact that the quality of the ware made by American potters is steadily improving. The prospects for 1906 in all branches of the clay-working industries seem to be very bright.

CLAY.

In the clay mining industry the conditions in 1905 were similar to those in 1904. The fire clay mined will naturally increase with the increase in the fire brick output. The potters seem to be unable to procure satisfactory supplies of American kaolin, although a considerable quantity of this material is used in paper making.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII.

JANUARY 30, 1906.

No. 2

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

CONVENTIONS.

The sixth annual meeting of the Wisconsin Clay Workers' Association will be held at Menominee, March 9, and 10, 1906.

The Eighth Annual Meeting of the American Ceramic Society will be held in Philadelphia, Pa., February 5-6-7, 1906. Headquarters at the Continental Hotel.

The Twentieth Annual Meeting of the National Brick Manufacturers' Association will be held in Philadelphia, Pa., February 7-8-9, 1906 (date of meeting).

A self-satisfied man is always conceited.

It is easy to smile at trouble—when it visits your neighbor.

Be sure you are right, but don't be too sure that everybody else is wrong.

The Clay Record is the only semi-monthly clay journal in America. The subscription price is only one dollar for 24 numbers. Try it now.

Spasmodic advertising is like trying to get a big business and then closing down the works and going on a vacation

the day after it comes. The very persistence of conspicuous, continuous advertising will keep your name and product before the reader, and if it is kept alive it is bound to make the probable customer write to you for an estimate.

The Illinois Clay Workers' Association meeting is over, and it was the best ever. Thanks to the professors and executive committee.

Beginning on the first Monday in February of this year the University of Illinois at Champaign will open for the first time a school of ceramics, which will give full courses in all lines of the clay interest. This has been largely accomplished by the Illinois Clay Workers' Association. The course will be most thorough and complete and great results are looked forward to in advancing the scientific development of all branches of the clay-working industry. The university offers each year to each county in the state one scholarship which will be awarded by the trustees of the university to applicants who intend to pursue either of the regular courses. They will be awarded through the Clay Workers' Association upon the recommendation of either its President or Secretary.

The annual session of the Illinois Clay Workers' Association, which has just recently closed at Champaign, was one of the best and most successful meetings ever held by the association. The program was of three days' duration instead of two as heretofore, and consisted of four sessions that were all crowded full of interest. The quality of the papers read and the discussions engaged in were of an exceedingly high order and far surpassed those of any session held in former years. The attendance was also exceedingly gratifying, there being one hundred and twenty-four in attendance. The association is in a most flourishing condition and has a membership of almost two hundred. The banquet was an elaborate affair and not to be overlooked. The genial Mr. A. L. Converse was the toastmaster of the occasion, and his wit and humor afforded sufficient merriment to enable every one to enjoy it with good digestive powers. The hotel accommodations were of a high order and, in fact, everything passed off in a most satisfactory way and there was nothing to mar the meeting in any respect. In our present issue we give a complete synopsis of the first session and will follow it up in each subsequent edition until we have given you the fullest details of the entire session. We trust to make these articles exceedingly interesting to all the brick trade and hope that great good will result from the labors of the convention—as we will give the papers and discussions in full.

OBITUARY.

John Druecker, 23 Wisconsin St., Chicago, Ill., dropped dead of heart disease. He was 68 years old and was a wealthy dealer in cement at Chicago.

Joseph Moon, an aged potter, who resided in East Akron, Ohio, for 25 years, died of paralysis. He was 76 years old.

Edward Reid, formerly in the brick and tile business at Geneva, Ohio, died at Ashtabula.

Henry Packman, aged 65 years, one of the oldest and most prominent residents of Greenock above McKeesport, Pa., died of pneumonia. For many years he was a large brick maker.

Sylvester Robertson, an old citizen of Birmingham, Ala., a brick maker and contractor is dead. He was 69 years of age.

George C. Snadley, president of the Jefferson County National Bank at Arvada, Col., died in Denver of kidney trouble. He had just contracted for a \$50,000 brick making plant for Fort Collins, which will soon be put into operation on his hands.

ACCIDENTS, DAMAGES AND LOSSES.

The McFeely Brick Company's plant at Latrobe, Pa., was practically wiped out by fire. It is estimated the loss will reach \$125,000, which is covered by insurance.

Fire of unknown origin destroyed the pottery of the Pfaltzgraff Stoneware Co., York, Pa. The loss is estimated at \$25,000, covered by insurance to extent of \$20,000.

Al. Graham, an employe of the Brazil Clay Co., Brazil, Ind., was severely injured by a mixed shot, that he tried to drill out, the powder of which had gone off, the dynamite explosion catching him.

In the suit of an employe against the York Harbor (Me.) Brick Co. for damages amounting to \$3,000 for injury while at work for the company, the court gave a non-suit after the evidence of the plaintiff was heard.

A permanent injunction has been granted against the Miller Brick Co., Alleghany, Pa., by the city preventing the company from excavating on their property.

Henry Moore has brought suit for \$10,000 damages against Pohlman & Reese, brick makers at Davenport Ia., on account of the clay bank falling on him while at work.

W. G. McCleary has been appointed receiver of the Kellerton (Ia.) Brick & Tile Co., at the solicitation of A. H. Teale, one of the owners. Mr. Teale and W. W. Pasley own the company.

John Hunter, an employe of the Athens (O.) Brick Co., while feeding a crusher in some manner got his hand caught in the belt. By a supreme effort he wrenched his hand away and escaped terrible death.

The brick property of Gabriel D. Stanford at Lake Charles, La., was sold at bankrupt sale to Mrs. Hattie Andrews for \$7,600.

The United States district court of New York has appointed Lindsay Russell receiver for the H. Huennekes Company of New York.

CALENDERS FOR 1906.

The Fernholtz Brick Machinery Co., St. Louis, Mo., are sending out an embossed calendar of the hunting dogs, also advertising the Fernholtz Improved Brick Press and auxiliary machinery.

E. M. Freese & Co., Galion, O., has issued a very handsome calendar, the "Sunset on Long Island," with the name of the firm and brick, tile and terra cotta machinery on the margin.

E. S. McLain & Son, brick manufacturers at Pittsburg, Pa., this year is presenting a reproduction of De Costa Smith's "On Watch." It is an Indian subject and very fine.

A. M. & W. H. Wiles Co., manufacturers of brick machinery, moulds and trucks, at Grassy Point, N. Y., are out with their annual. This year it is a child subject. Two little ones at the well—"Have a drink."

The Jeffrey Manufacturing Co., Columbus, O., were not to be outdone in this line. The picture is that of the "Jeffrey Cutting and Hauling the World." The name is familiar to everyone.

C. M. Adams, brick manufacturer at Alexandria, La., is out this year with another good one. This time it is "See the Conquering Heho Comes," by Witkowski. Very attractive.

TO ASK POTTERY WORKERS TO SETTLE IN THE SOUTH.

Macon, Ga.—With the advent of the new officers of the chamber of commerce, Macon will begin efforts to remove from the minds of the pottery workers' unions in the United States and abroad the impression that the south is an undesirable place of residence because of alleged social conditions and climatic conditions. Report has been made that the pottery workers' union in Europe and in the northern part of this country refuse to issue charters for new unions or to exercise jurisdiction in the "black belt" of the United States, which means the southern states, and for this reason the vast kaolin deposits in Macon's territory cannot attract investment in crockery plants. It is said that the pottery workers incorporated this provision in their international law because the impression has been created in many parts of the world that the south is a barbarous country, where whites and blacks are at continual warfare, and where there is so much malaria that good health is impossible.

The business men of Macon are inclined to believe that this affords a rich field for missionary work, and they propose to go to the root of the evil by getting in direct communication with the officers of the international association of pottery workers. The matter is of vital interest to Macon, because it is declared that a great deal of money would have been invested in crockery plants for manufacturing Macon's matchless kaolin if it had not been for this condition of affairs.

GROUND IS BROKEN FOR LARGE POTTERY.

Ground is being broken in Poughkeepsie, N. Y., for what will be, when completed, the largest stoneware pottery in the United States. "The company which will be a branch of a large pottery in Germany, has acquired sixty acres of land and its buildings for the present will occupy twelve acres. Ocean going vessels will transport the raw material from Germany direct to the pottery and about 600 men will be given employment when the works open. Many of these will come from the four potteries of this company in Germany, being skilled artisans. High freight tariffs on the manufactured ware and high rates of duty have compelled this company to locate a plant in the United States notwithstanding that the necessary raw material to manufacture acid proof pottery has not as yet been discovered here and must be imported."

TO INCREASE CAPACITY OF BRICK WORKS.

The building of twenty more houses for employees, an increase of the number of men and the enlargement of the plant by 50 per cent are some of the things decided upon at the annual meeting of the Buckeye Fire Brick Company at Scioto Furnace, Ohio.

The stockholders re-elected the company directors, consisting of T. C. and Jos. Moulding, Dr. H. N. Goodsmith and C. N. Combs, of Chicago, E. P. Stevens, A. T. Holcomb, John Richardson, Floyd Knowles and Henry Prescott. The directors organized by re-electing T. C. Moulding, president; John Richardson, vice president; Henry Prescott, secretary, and E. P. Stevens, treasurer and general manager.

The company will build six more kilns and by other improvements increase the daily capacity of the plant from 32,000 to over 50,000. With the twenty new houses to be built the company will possess almost sixty houses that are used by employes.

MR. GUISE INVENTS NEW BRICK BURNER.

D. P. Guise, of the Guise Brick and Stone company, Williamsport, Pa., has been notified that a patent has been allowed on a combination brick kiln of his invention.

This idea of Mr. Guise's is expected to revolutionize the brick burning industry. The invention not only is a great saver of fuel, but only about half the time is required to burn the brick, as compared with the old method.

The invention has been tested thoroughly at the yards of the Guise company north of Williamsport.

BRICK MEN INDICTED FOR ALLEGED COMBINE.

John T. Windsor, William Windsor, Jr., Walter Akers, Alfred Akers, William Keller, Frederick W. Keller, Joseph Cooper, Samuel Cooper, William Cooper, James McCauslin and John McCauslin, members of five brick manufacturing companies of Akron and Cuyahoga Falls, Ohio, and George W. Carmichael, a prominent contractor and manager of the Akron Brick Exchange, were indicted, charged with combining to fix exorbitant prices for paving and building brick, and to prevent competition.

MASSEE AGAIN HEADS GEORGIA BRICK MAKERS.

Many prominent capitalists and manufacturers were in Macon today attending the regular semi-annual convention of the Georgia Brick Manufacturers' Association. When the convention was called to order in the offices of the Standard Brick Co., fifty delegates were present, among them being Messrs. N. J. Cruger and S. M. Brown, of Albany; Harry English, of Atlanta; C. H. Bickerstaff, of Columbus, and H. H. Stafford and Charles McKenzie.

W. Jordan Massee, of Macon, was elected president for the coming year, and W. E. Dunwoody, secretary and treasurer.

No previous meeting of the association has been marked with such enthusiasm and fraternal spirit as is the present one. Its purpose, as the president stated, is more effective organization for the improvement of methods and the reduction of prices. During the past few years the brick industry in Georgia has taken its place along with the foremost enterprises of the state and the convention today will give even an additional impetus to this already important business.

President Jordan Massee gave the delegates a luncheon at the Hotel Lanier cafe, and toasts were drunk that brimmed with cordiality for the host.

BRIGHT PROSPECTS FOR EDWARDS' VITRIFIED BRICK AND SEWER PIPE COMPANY.

The Edwards Vitrified Brick and Sewer Tile Company, Albion, Ill., composed largely of White county men, now have leases on 2,000 acres of land west of Albion which call for shale and mineral rights. This territory extends to Ellery and covers a well recently dug by the Creamery Company at that place. It is said that in digging this well a three-foot vein of cannel coal was found at the depth of thirty-six feet and that the water tastes so much like coal oil that it is unfit for creaming purposes. There are many indications of oil and coal on this territory, which is also rich in the shale deposits of which vitrified brick is made.

BOOKLET ON THE GREEN FUEL ECONOMIZER COMPANY.

Fans, Blowers and Exhausters for heating and ventilating, mechanical draft and other purposes are described in a booklet issued by the Green Fuel Economizer Co., of Matteawan, N. Y. This company has for many years installed fans and exhausters for mechanical draft in connection with the Green Fuel Economizer and has long been aware that important improvements could be introduced in air-moving apparatus. The amount of power required for driving is often considerable, as fan builders, under the stress of competition, have frequently offered small, inefficient high-speed fans where true economy for the purchaser would have indicated larger, slower-moving fans. The Green Fuel Economizer Co. does not contract for the engineering of plants, nor for the installation of heating and ventilating plants in competition with the heating and ventilating contractors. It has recently added large shops to its plant at Matteawan to handle this branch of the business.

THE FRISCO OFFERS GREAT OPPORTUNITIES

The St. Louis & San Francisco Railroad Co., better known as the "FRISCO," has built or added to its system, over nineteen hundred miles of new railroad during the past five years. Also another thing to be remembered is the fact that all of this new railroad traverses newly-settled sections of the Southwest, principally in Missouri, Arkansas, Indian and Oklahoma Territories and Texas.

These sections of the Southwest are rapidly settling up with a good class of Northern Immigrants impelled to locate in the Southwest for the following reasons: Lands for the cultivation of a wide range of crops can be purchased most reasonably; the climate is mild and there are no extremes of heat and cold, such as obtain in the Northwest, and ample rainfall annually to mature crops.

Most of the sections traversed by these new lines have not previously enjoyed the privileges of railroad communication and these lines, therefore, opened up entirely new markets to the manufacturer and wholesaler.

It is a self-evident proposition that it is cheaper to utilize in manufacturing the raw material at its source, instead of shipping it in a crude state to some large city or remote, thickly settled section. This is a fact that manufacturers are beginning to realize more and more and for various reasons are turning their steps toward the singularly favored locality.

The principal raw materials available in large quantities for manufacture are cotton and its by-products; all of the grains; almost every kind of timber found in the North Temperate Zone; all of the truck crops, vegetables, melons and fruits; minerals, including iron, lead, zinc, gypsum; stone, including granite, limestone and cement rock suitable for Portland cement; highest grade shale for pressed, paving and firebrick, pottery, tile and sewer pipe; and last and most important, this fact, that in almost every portion of the States and Territories traversed by the Frisco System, fuel supply is abundant, either bituminous or semi-anthracite coal, oil or natural gas being procurable.

Labor troubles also in the Southwest are of much less frequent occurrence than in the large cities and thickly-settled localities of the North and East.

Possibly the most attractive inducement, however, that could be given manufacturers to secure the location of their industries, is the fact that they would in most cases have a proprietary right to a vast section of rich territory, as they would be almost the only manufacturer in their particular line in the Southwest. They would, therefore, be free from much of the close competition met with in the factory sections of the North and East.

From the above extended list of natural resources for manufacturing it can be readily seen that almost every kind of manufacturing plant can be accommodated with an excellent location.

Mr. M. Schultze, Industrial Commissioner of the Frisco System, St. Louis, Mo., would like to get in correspondence with any manufacturers not entirely satisfied with their present factory location, and will cheerfully furnish data regarding favorable locations, inducements, etc.

POTTERY NEWS ITEMS.

The Donaghho Pottery at Terrapin Park, Parkersburg, W. Va., has been sold to Senator Camden and the building will be moved to other ground.

The Comal Earthenware Co., New Braunfels, Texas, is the style of a new firm just organized by Emil Heinen of this city and H. T. Nordhurst of Ft. Worth.

Rapp Bros., proprietors of the Morton (Ill.) Pottery, have purchased eight acres of land in East Peoria, and will build a pottery there.

J. W. Luper contemplates installing machinery for increasing the capacity of the pottery at Tullahoma, Tenn.

The Sun Porcelain Co., Oakland St., Trenton, N. J., has been incorporated with \$10,000 capital stock. Incorporators, Chas. J. Hetzel, Alfred C. Grainger and Geo. W. Wycoff, all of Trenton.

The Mason City (Ia.) Sewer Pipe factory contemplates the enlarging of the output of their plant by the manufacture of jugs and crockeryware.

The Marshalltown (Ia.) Pottery Company is to embark in a new business in the near future, the manufacture of porcelain ware. The business will be the only one of its kind conducted west of Ohio.

The Croxall Pottery Company, East Liverpool, Ohio, has reduced its capital stock from \$50,000 to \$25,000.

The Patterson Foundry & Machine Company, East Liverpool, Ohio, recently made a shipment of pottery machinery to Seattle, Wash., for a stoneware plant that is under course of construction there. Another large shipment was made to a firm in Lexington, Ky.

Monmouth, Ill., is to become the headquarters of a pottery combine with \$1,250,000 capital stock. W. D. Breton will be at the head of the organization.

The art goods which are made at the Tiltonsville (O.) Pottery are to be given to the Wheeling potteries and sanitary ware is to be made instead.

The Northwestern Stoneware Co. has been formed at Spokane, Wash., to handle the output of the several potteries of the Northwest. The incorporators are F. H. Oliver, E. K. Erwin, G. M. Swartwood and C. H. Patton.

The employees of the Ideal Fire Clay & Porcelain Works, Trenton, N. J., presented to Samuel P. Alpaugh, retiring superintendent, and Jacob Lindley, retiring foreman, handsome signet rings set with diamonds on their departure for Tiltonsville, Ohio.

William Rabb is canvassing the city of Waterloo, Iowa, for subscriptions to start a pottery.

The Volunteer Coal Co., What Cheer, Ia., manufacturers of brick and tile and miners of coal, contemplate the establishing of a pottery in connection with the business.

The Angora China Co., Minerva, Ohio, has been incorporated with \$10,000 capital stock by J. Shumaker, Willard Pennock, E. R. McKean, W. H. Taylor, W. R. Kurtz and J. A. Kurtz.

SAND OR LIME BRICK OR BLOCK NEWS.

The Semi Steel Company of Cleveland, Ohio, have now completed a sand-lime brick plant for the Sandstone Brick Co. of Schenectady, N. Y.

D. McArron, of the Cement Brick Co., Port Huron, Mich., has presented a proposition to the Chamber of Commerce of that city for a cement brick plant which will be accepted.

The Holland Brick Co., Holland, Mich., has just installed a new press which will double the capacity of their sand lime brick plant.

The Minnesota Pressed Brick Co. has been organized at Bemidji, Minn. S. D. Work of Mankato is one of the principal owners.

The Menominee (Mich.) Brick Co. will soon commence the manufacture of sand lime brick with the word "Menominee" stamped on each brick, thus advertising the town. At the annual meeting the old officers were re-elected and it was decided to double the capacity of the plant.

The annual meeting of the Lake Superior Sand Brick Co., Calumet, Mich., was held the 29th. The old officers were re-elected, all of which are copper country people. The plant has been successful ever since it was started.

The Owensboro (Ky.) Sand Lime Brick Co.'s plant is now shut down for the purpose of making extensive improvements. New engines and boilers will be put in and another brick press will be added and the plant will be considerably enlarged.

The Granite Brick Co., Dublin avenue, Columbus, O., which is composed of Columbus and Plain City men, is now making brick. The officers are U. P. Lenox of Richwood, president; O. W. White of Plain City, vice-president; W. L. Curry of Columbus, treasurer; J. E. Robinson of Columbus, secretary, and C. A. Rausch of Plain City, manager.

The plant of the Fremont (Ohio) Pressed Brick Company is again running in full blast. The concern is far behind in orders.

The International Asphaltum Construction Co., Ardmore, Ind. Ter., has been organized with H. G. Stoney, president and treasurer; Peter Graham, vice-president; A. G. Edwards, secretary, and M. L. Hurst, general manager, to manufacture brick from asphaltum, clay and shale.

John J. Bishop, Spartansburg, S. C., has engaged in the cement brick manufacturing. Claude Foster is associated with him and they propose to do extensive operations in brick making in Lounes and Greenwood.

C. W. Williams & Co., Easton, Pa., are now producing several dry colors for use in cement and sand lime brick manufacture that are attracting attention. They are able to specialize in their work beyond the average manufacturer in their line. They manufacture a black which is used largely for mortar colors that is looked upon very favorably by leading architects. They are the largest producers of colors in the United States, having three plants in Easton and one in Allentown, Pa.

MISCELLANEOUS ITEMS.

M. B. Taylor, of Jackson, Miss., has bought land south of Crystal Springs, Miss., and will build a brick making plant. Machinery has already been bought.

Humboldt, Nebr., is to have a new \$50,000 brick plant. C. M. Linn is president; A. A. Tanner, vice-president, H. E. Boyd, secretary, and C. Z. Hummel, treasurer.

The Two Rivers (Wis.) Brick Co. has been incorporated with \$25,000 capital stock. Frank L. Wolfe and others are interested.

The Whitewater (Wis.) Brick & Tile Co. has been incorporated with \$80,000 capital stock, by F. H. Kiser, W. H. Francis, L. P. Beach and F. A. Moore.

The Continental Fireproofing Co., Cincinnati, O., has been incorporated with \$10,000 capital stock, by T. G. Nicholson, C. C. Rothler, Louis J. Hoppe, J. A. Keadin and A. Friberg.

The Maumee Brick & Tile Co., Fort Wayne, Ind., has been incorporated with \$25,000 capital stock. Officers: George Jaap, president; John A. Koehler, vice-president and manager; J. E. France, secretary, and Gottlieb Haller, treasurer.

Gunderson & Masse, Baudette, Minn., owners of a saw-mill there, have bought land and will build a brick yard on same.

Arthur C. Sharpley, owner of the Sharpley Brick Works, Bessemer, Ala., has released the ground on which the plant is located and bought additional ground and will enlarge his plant.

Cairo, Ills., is to have an extensive brick and tile plant. Twenty acres of land has been purchased and the plant will soon be in operation.

John Peifer, Harrisburg, Ark., wants to organize a company to put in a tile works. He operated a small plant last year, and found a ready market.

The Trenton (Mo.) Brick & Tile Co. at its annual meeting decided to make tile in addition to brick, and machinery will be bought for this purpose.

The California Tile & Terra Cotta Co., Los Angeles, Cal., has been incorporated with \$500,000 capital stock. Directors are: L. Lindsav, E. M. Durant, E. Randolph, B. Curtis and F. C. Keller. It will take over the Western Art Tile Co.'s plant.

The Grand Ledge (Mich.) Clay Products Co. will erect a tile factory in the spring on a site of forty acres which they own.

The Iron Clay Brick Co., Columbus, O., has been incorporated with \$300,000 capital stock, by W. D. Brickell, D. C. Mechan, A. R. Paff, C. J. Neare and G. J. Marriott.

The Gleasonston (Pa.) Fire Brick Co. will start operations after a shut-down of five months.

The Eureka Fire Brick Co., Mt. Braddock, Pa., has arranged to run their works both day and night on account of the demands for brick.

The Fairmount (Ind.) Tile Co. will close its plant down to make repairs and add new machinery and a kiln.

The Milton (W. Va.) Brick & Merchandise Co. is dissolved, and S. J. Hollandsworth and W. S. Bowles become the owners of the brick works.

The well-known firm of Kerr Bros., Wrightsville, Pa., has been dissolved and the interests purchased by B. F. Beard, who will continue the business.

The Tuttle & Hudson Brick Co., Moberly, Mo., has been incorporated with \$30,000 capital stock. Incorporators: F. J. Tuttle, F. D. Hudson and M. A. Tuttle.

The Aberdeen (S. Dak.) Brick Co., recently re-elected officers and passed resolutions to double the capacity of the plant. A 10 per cent dividend was declared.

The Fond du Lac (Wis.) Pressed Brick Co.'s officers decided to purchase a new 150 horse power engine and boiler, a pulverizer and a new pressed brick machine. They will also make 40,000 brick per day by the soft mud process.

The Muskogee (Ind. T.) Vitrified Brick Co. will resume operations and will enlarge the plant and put in more kilns. They will use fuel oil in the future in its operations.

H. H. Shellenberger, H. O. Keener, H. H. Myers, H. S. M. Cowgill, vice-president of the National Drain Tile Co. at Terre Haute, Ind., was recently elected president of the Indiana Drain Tile Association, which meets at Anderson.

The Emmetsburg (Ia.) Brick & Tile Co. has been organized. G. G. Wheat is president; H. C. Shadbolt, vice-president; E. B. Persons, secretary and E. B. Soper, treasurer. All estimates for buildings and materials will be in by Feb. 15th.

The Southern Brick & Tile Works, Jackson, Tenn., recently elected Dr. R. A. Jones, president; W. J. Hunt, vice-president; C. M. Thompson, secretary and treasurer, and X. B. Wickersham, general manager. Hereafter they will make only high-grade dry pressed brick and fire brick. A 10 per cent dividend was declared.

Beginning with the New Year Albert and Lincoln Solfisburg of Aurora, Ill., take over the Solfisburg Brick Works, which were operated by C. Solfisburg, deceased, for the past 40 years. Several improvements have been made to the plant.

The Wooster (O.) Shale Brick Co. recently elected the following officers: D. C. Curry, president; John Stevens, Jr., vice-president; A. Branstetter, treasurer; Chas. E. Curry, secretary and manager. Extensive improvements will be made in the plant.

The large brick plant recently moved to Commanche, Ind. T., from Lawton is about ready for operation. Quitt & Cameron, the owners, already have orders for brick. W. Bausman, John Kramer and Frank Slack are the principal movers in a deal to lease the Keener Brick Works at Middletown, Pa.

H. G. Hanson will establish a plant at Dean, Ia., for the making of tile.

Dewitt Rowell will establish a brick making plant at Mathiston, Miss.

The capital stock of the Corona (Cal.) Pressed Brick & Terra Cotta Co. has been increased from \$75,000 to \$150,000.

Worland (Wyo.) will have a pressed brick plant just as soon as the frost is out of the ground. Capacity, 12,000 per day.

The Atlanta Terra Cotta Co., Tottenville, L. I., N. Y., will establish a brick manufacturing plant beside their terra cotta works.

The Mason Supply Co., Mason St. and C. & P. tracks, Cleveland, O., is negotiating with Akron brick manufacturers to buy their plants to supply their members with brick.

Jack Lenig, backed by several Sunbury, Pa., people has bought the old Martin Gass farm 2 miles east of town and will build a plant with the latest improved machinery for making pressed brick.

The Algona (Ia.) Brick & Tile Co. has been incorporated with \$20,000 capital stock by L. J. Dickinson, president; Nels Ostrom, vice-president, and F. S. Potter, secretary and manager.

The Mansfield (Ark.) Brick Co. has brought in their third gas well and are drilling the fourth. They are preparing to put in a vitrified brick plant to compete with Kansas brick from the gas belt.

The Evans & Howard Fire Brick Co., St. Louis, Mo., recently elected the following officers: Cecil D. Gregg, president; Andrew Sproule, vice-president; Geo. W. Jones, secretary and treasurer.

Banker H. L. Emmert, Sibley, Ia., offers \$100 to anyone who will find a 3-foot vein of tile clay within 4 feet from the surface and within 3 miles from town. He is desirous of having a tile factory.

William Halls, Jr., who bought the Ferguson Brick Co.'s plant at Troy, N. Y., at bankrupt sale has transferred same to the Cary Brick Co. of Cohoes, N. Y., who are now cleaning up preparatory to starting same.

Roeske Bros., Michigan City, Ind., are erecting a dry kiln at their plant that will dry 50,000 brick per day, so they can run their plant winter and summer so as to take care of the demand.

The Grinnel (Ia.) Brick & Tile Co. has been incorporated with \$50,000 capital stock. H. W. Spaulding is president; H. H. McHose, vice-president; C. A. Smith, secretary and general manager; Joel Stewart, A. J. Neeley, R. G. Coult, O. K. Cole, Wm. Vogt and Dr. U. M. Hibbetts are directors. They take over the McHose plant and rebuild and enlarge it.

The Indiana Fire Clay Co., Montezuma, Ind., was incorporated the first of the month. D. N. Lanyon is president; J. A. Heber, vice-president, and J. S. Hollowell, secretary and treasurer. The new company takes over the D. N. Lanyon plant, the Hoosier Clay Works and the Wabash Valley Co., all clay grinding works, with a 1,500-ton per week capacity.

CLAY RECORD.

CLAY LAND FOR LEASE.

On a 32-acre farm, 4 miles west of Macomb, Ill., containing 20 acres of a 10-foot vein of fine pottery clay, a 5x10-foot shaft in good repair at same. Will lease from one to ten years or longer at 10 cents per ton, weighed on ground and settled for monthly. Company to have access to any part of land for mining and digging clay. Also a vein of coal 25 to 30 feet below the clay to lease at 1/4 cent per busbel. For further particulars address

MILTON McDONALD,
Lock Box 39 P. R. 5, Colebester, Ill.

FOR SALE.

One complete brick yard plant, consisting of boiler and engine, stiff mud machine, rolls, automatic cut-off, shifting pulleys, belting. Complete equipment for a 25,000 capacity plant. A bargain if sold at once.

WM. W. THIRLBY,
Traverse City, Mich.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

Profitable running brick plant, 25,000 capacity. Ready sale for entire product. Owner has larger interests requiring attention.

TERRA HAUTE PRESSED BRICK CO.
Terra Haute, Ind.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address
T, care Clay Record,
Chicago, Ill.

FOR SALE.

For sale, reasonable, in condition—
One 5x18 foot Horizontal Tubular Boiler.
One No. 20A Penfield Hollow Brick Machine.
One 14 foot Pug Mill.
One Disintegrator,
One 40 foot Clay Conveyor, with 20 foot belt.
Forty Fire-proofing Dies, with two extensions, pullys, clutches and belting.
Reasons for sale, are making different ware.
R. 611, W. 51st St.,
New York City.

FOR SALE.

One 25-horse power Engine and one Henry Martin steam power Soft Mud Brick Machine. Address
LOUIS SCHMIDT,
Grand Island, Neb.

WANTED.

A second hand No. 6 Brewer Brick and Tile Machine. Address
EDMONDSON & ROGERS,
Kalona, Iowa.

FOR SALE CHEAP.

A good second hand
E. M. Freese & Co.,
Brick and Tile Machine.
Address E. R. K., Care Clay Record, Chicago.

WANTED

Wanted at Once.—A first class experienced brick burner and setter. State age, experience, salary expected and reference.

B. S. ELMES
Fergusson's Wharf, Va.

FOR SALE OR TO LET.

A complete and only Brick Yard in city of 60,000 population, in good running order. Demand unlimited and prices good. Owner 35 years in business and wishes to retire. Address

SHERMAN A. CASE
Schenectady, N. Y.

Machinery For Sale.

FOR SALE

Two Wiles Soft Mud Steam Power Brick Machines. Two Tempering Wheels for horses. 40 b.p. Boiler. 30 h.p. Engine. 5 or 6 Trucks. All necessary Belt and Shafting. Also about 500 feet light Steel Rails with Switches. Everything in good working order. Will sell cheap as we have started an in-door yard.

E. T. & IRVING HAND,
Plainfield, N.J.

FOR SALE

One Komnick 1000 to 1200 per hour sand-lime Brick Press in good condition. Was replaced with larger capacity press, same make. Inquire of the
SAGINAW SANDSTONE BRICK CO.
Saginaw, Mich.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.

Both styles of cars in first-class repair.
ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address
"GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.

THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new. DEALER,
Care Clay Record, Chicago, Ill.

FOR SALE CHEAP.

One second-hand Chandler & Taylor 80 horse-power Horizontal Tubular Boiler, 60 inch diameter by 6 feet long, with full flush front.

AMERICAN CLAY MACHINERY CO.
Bucyrus, Ohio.

FOR SALE.

One 70 horse power Frost Tubular Boiler, one 45 horse power Frost Slide Valve Engine. In good condition, will sell cheap as we have changed to electric power.

CENTERVILLE BRICK & CONSTRUCTION CO.
Centerville, Iowa

WANTED.

An experienced and competent brickmaker to take charge of soft mud plant near Cincinnati. State experience, references and wages expected.

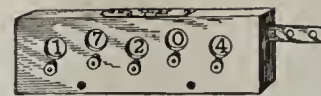
GENERAL SUPPLY & CONSTRUCTION CO.
24 State St., New York.

BRICK PLANT FOR SALE.

Splendid Chance for Contractor.

One of the finest, most modern brick plants for sale in southern part of Central Illinois. Live growing city, good prices, making money. Dry press, built in 1904. Best of reasons for selling. Price \$25,000, if taken at once. Address

ILLINOIS, care Clay Record.



Paper Joggers quoted.
R. A. HART, 41 White St.,

No better made, cut from
\$8 and \$10, to
4 Wheel, \$3.00
5 Wheel, \$3.25
Guaranteed.
Sold by all dealers
BATTLE CREEK, MICH

FOR SALE.

Up-to-date brick plant with Creager machinery, in prosperous city of 15 000 inhabitants, in Southern Illinois. Good residence and farm of 40 acres attached to plant. Splendid opportunity. Only plant in city. Address

H. H., care Clay Record, Chicago.

CARS WANTED.

Two transfer, two flat and two turntables, 24 inch gauge. Sander wanted also.

E. T. & IRVING HAND,
Plainfield, N. J.

MACHINERY FOR SALE.

One new steam iron Quaker soft-mud brick machine, bought of the Wellington Machine Co. Seventeen iron-bound molds, one dump table, all new; never been used. Capacity 30,000 per day. Address
G. W. NICHOLS,
Stockbridge, Mich.

POSITION WANTED.

Position as manager of brick or tile plant, by an experienced man. Can build a complete up-to-date plant and operate it successfully. Address

UP-TO-DATE,
Care Clay Record, Chicago.

FOR SALE CHEAP.

First-class brick and tile plant. Good machinery. unlimited clay supply, 25,000 capacity daily, 3 kilns 170,000 capacity, dry sheds, etc. Track connections, A snap if taken at once. Address

H. C. MODLIN, Secretary,
Perry, Iowa.

ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

PALLET WANTED.

Wanted 3500 all steel foot pallets, 36 in. long by 10 1/4 in. wide by 3 3/4 high. State gauge of steel, width of foot and general details.

FAYETTE FIRE BRICK CO.
Uniontown, Pa.

FOR SALE.

The Newport brick and Tile plant at Newport, Indiana. Address
JOHN RICHARDSON, Receiver.

PARTNER WANTED.

With experience in modern brick making. Material suitable for fire, face, enamel or paving brick. Good proposition for a hustler with some money to invest. For particulars address

W. P. ALLEN,
Enterprise, Kansas.

FOR SALE OR EXCHANGE.

One of the best small brick and tile plants in Southern Michigan. 20,000 capacity, Stewart patent kilns, good drying sheds, all machinery in first-class condition, fine clay, good market. Will sell at a bargain or will exchange for good real estate.

Address,
MICHIGAN,
Care Clay Record, Chicago

FOR SALE.

31-Acre tract of land located in Central Iowa. The finest kind of clay underlaid with coal. Two roads running up to the line of property.

ARTHUR H. LIBBY,
233 Railway Exchange Bldg., Chicago.



Vol. XXVIII. No. 3.

CHICAGO, FEBRUARY 15, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

A REPORT OF THE TWENTY-EIGHTH ANNUAL MEETING OF THE ILLINOIS CLAYWORKERS' ASSOCIATION.

SECOND SESSION.

The second session of the Twenty-eighth Annual Meeting of the Illinois Clay Workers' Association, pursuant to adjournment of the first session on Tuesday evening, was called to order, President John W. Stipes in the chair, at 10:30 A. M. Wednesday, January 24th, 1906, at Elks' Auditorium, Champaign.

President Stipes: Gentlemen, our secretary, Mr. George H. Hartwell, informs me that we lack just one of having the largest number enrolled at this annual meeting that we have ever had. Any who have not registered, please come forward. I will name for the Committee on Resolutions J. M. Mamer, H. de Joannis and S. J. Shaw.

The first number on the programme is the paper "Observations and Notes Gleaned on Visits Among the Clay Workers of Illinois," by Ross C. Purdy, Instructor in Ceramics, Champaign.

OBSERVATIONS AND NOTES GLEANED FROM VISITS AMONG THE CLAYWORKERS OF ILLINOIS.

One of the most gratifying features of my visit among the clayworkers of Illinois was the hearty cordiality toward the Ceramic department of our University and the State Geological Survey. Fortunate is it that the clayworkers of this state are unanimous in their support and encouragement of these two institutions. Credit is given to this association for taking the initiative in the organization of forces for and effort toward the passage of the bills making these two organizations possible.

Fully awake are the large majority to what has been and what can be accomplished in a volunteer organization of this character. Yet I found a few who do not realize the benefits to be derived by affiliation with this association. They fail to see that the inspiration for the larger part of the technical advancement in their own field was originated and fostered by such organization. That it is in associations of this character that the greatest and most beneficial movements in our own line have been cradled cannot be denied. "What benefits can I derive from being a member of the Illinois Clayworkers' Association?" was not an infrequent question. I answered that the association would not have existed and cannot continue to exist without a membership and that the more substantially it is supported the greater will be its efficiency. It should not be a question of what the individuals are going to receive by being associated with us this year or next year, but it should be rather a ques-

tion of whether it is not a duty to share the burden and aid the cause, the fruits of which are so evident in the impetus given to technical progress in schools, technical commissions and surveys.

A few have argued that their processes and products have been developed to their present high degree of excellence without the direct aid from associations or schools, and cannot see but what they have received but little if any help from them. Granting that there are individuals who have not been *directly* aided, let us consider the question in a larger sense.

Inventions of machinery and discovery of ceramic compositions were made when pure science was in its infancy. They were not so much a result of a general scientific enlightenment, but rather of individual inspiration of creative minds that pursued investigations doggedly and made discoveries after repeated failures, troubles and disappointments. Here and there in the past there are men whose achievements stand out brilliantly against those of the lesser inspired or less able ones in the craft, whose greatest ability was evidenced in the success with which they stole and applied the fruits of their more brilliant fellow craftsmen.

The development of pure science in the early days was made possible only by independent investigators who published freely the results of their researches. From these studies recorded and correlated, broad laws were formulated and truths established from which we today have our highly developed sciences of Geology, Chemistry, Physics, etc. If our earlier clay manufacturers had not so jealously guarded their discoveries, and had the knowledge they acquired been disseminated otherwise than through the dishonesty of their unscrupulous competitors, there is no telling to what degree of perfection Ceramic technology might have attained.

In the domain of pure science, schools were founded upon the results of the researches of the few, isolated but broad-minded discoverers whose results are thus made of almost infinite value and extent. In the domain of ceramic technology the secretive and jealous discoverers slowly multiplied because of the pure science being thus more broadly disseminated, yet they did not and could not found broad ceramic laws or principles until they banded together, exchanged experiences and correlated their several achievements. Earlier an apprentice began where his predecessor began, covering the same ground. The time has now dawned, however, when he will be able to profit to a large extent from what has been accomplished by others and forge ahead.

It is evident that as means for scientific ceramic education are multiplied the more rapidly will we advance. Associations are a very potent factor as educational institutions. We cannot progress by jealously guarding our individual discoveries, and by enforcing strictly the "No Admittance" edict so necessary nowadays to pre-

serve factory discipline. Exchange of views are of great aid to the individual and a most important factor in the general advancement of science. All should willingly support institutions which stand for scientific advancement. As citizens, we are all compelled to support our University, yet how does our University benefit the day laborer, carpenter, mason, merchant, etc., who are compelled to help in its maintenance. That need not be answered, but let it be said that every ceramic worker is in as large a degree duty-bound to support those institutions that stand for the upbuilding of his craft as is the citizen to support those institutions of learning that stand for the upbuilding of good, intelligent citizenship. Membership in this association will be of advantage to the individual and a strength to our ceramic institutions of learning.

The qualification and training of the superintendents and managers of our various ceramic industries is a study that was made in view of a guide in the preparation of a ceramic curriculum. Erstwhile bookkeepers, machinists, carpenters, contractors, doctors, lawyers and most anything other than a college graduate is to be found at the working head of our factories. As a rule, however, machinists are in the majority as superintendents.

Many of our ceramic industries are dependent so much more largely upon mechanical processes than upon chemical, that it requires a mechanic to supervise their operation. In the brick industry the pure sciences aid in the selection of material and in the economizing and controlling the burning, but beyond this it must be frankly stated that the pure sciences enter but very little into consideration. In terra cotta, pottery, glass and cement industries, the case is very different. There the superintendent should be equally as well trained in pure sciences and mechanics.

Our ceramic school should not and cannot, with justice to the broader development of ceramic technology, confine its whole endeavor to preparing her graduates to become superintendents. They must necessarily train a few men for the more theoretical work which leads us on to greater possibilities in even our more simple industries. The majority of our students, on the other hand, will in time, become foremen, superintendents and managers. But whether the future work of the graduate shall be along theoretical or practical lines, the same fundamental training must be given to both. Therefore it was demonstrated to my satisfaction that our courses of study should be designed to develop both the mechanical and scientific phases of ceramic education. Particularly should the cement course be strong in mechanical engineering, for the cement manufacturers find that as superintendents they must have men whose training has been in the mechanics, though they cannot for a day dispense with the services of a chemist.

Technical ceramic schools in this country are yet too young, and too few in number to have many trained ceramists in the field. The few, twenty or less, who can claim to have received a full ceramic training in our ceramic schools are "making good" and rising rapidly to positions that carry honor and responsibility. But when it is considered that there are about 500 ceramic industries in Illinois alone, it is readily seen why our graduates are not more in evidence. A glance at the transactions of our technical societies will reveal the valuable work these graduates are doing, and their desire to impart to others the results of their labors.

In studying the industries of this state, I was impressed with the need of a better understanding of the geology of clays. Geological history of clays is useful, but the correlation, the tracing and identification of deposits, is the thing our clayworkers should understand more fully. I noted that we have a few factories so located that the winning of their clay is too expensive and is growing more so as they work back into the bank. A better knowledge, before the erection of a plant, of the geological formation, the dip and the horizontal variation in strata would have caused less embarrassment today. To invest \$60,000 in plant on a deposit of shale which, due to what is known in geology as a fault, will vary abruptly from a good paving brick shale to one that is practically worthless for the purpose, is slapping science in the face. A trifle spent in properly inspecting the proposed site by a geologist or ceramic technist would seem to

be as wise as paying a lawyer a fee to trace the title of the property.

In the general manufacturing processes many mooted questions as to the merits of this or that method were noted as being of very live interest. Research must be made on a large scale covering wide range of variation before a great many of these questions can be answered. At any particular plant these questions can be worked out for the particular clay at hand, but such evidence can only be judged as circumstantial when determining the general and fundamental principles involved. Individual companies are not inclined to work out these problems in a broad way, and the problems are too large for the individual. They must find their solutions in investigations carried on by associations or ceramic schools.

Each of you know your several problems, and it is not necessary to enumerate them at this time.

In regard to kilns it can be said that all kinds are in the state. The continuous kiln with fixed fire and progressing ware has been, and is being experimented with, and the continuous kiln with fixed ware and progressing fire is now in successful operation. Flue, floors, fire-pockets, walls of all kinds, kilns of all shapes and capacities are in use. After all this frenzied experiment and investment in kilns, we are not much nearer to the solution of the question of the most economical and efficient method of burning. To properly investigate this problem will require a large outlay of energy, time and money, but I believe the time is not far distant when we will have this most important question solved. The best methods of carrying on this work is a matter that ought to be considered by this association.

One of the most unique plants for the utilization of waste heat from burning and cooling kilns is about to be tried by the Macomb Pottery Company. The products of combustion from burning kilns and hot air from cooling kilns will be drawn under the boiler and then distributed through the factory for heating and drying purposes. This company's bold experiment will be of vital interest to every clayworker, and their results will be as anxiously looked forward to as were the results of the famous Fiske experiments in substituting electric power for hand labor in brick manufacture.

The question of the use of producer gas using waste heat from cooling kilns for combustion is a problem suggested by a visit to the Alton Vitrified Brick and Tile Co. There they are successfully using producer gas in a continuous kiln effecting a great economy in fuel. Pre-heated air is a requisite in the use of producer gas, and in waste heat we find the solution to that part of the problem. The question as to whether the waste heat can be more economically used in the dryer than in conjunction with producer gas is a question that needs to be solved. It is at least a possible means of effecting an economy in burning kilns on the unit type.

Many are the problems noted in my short visits among the clayworkers, but time will not permit me to enumerate or to discuss them. That Illinois is doing, and will continue to do, her share in furthering the solutions of the problems confronting our ceramic technists is evident, and I look forward to a great technical advance in our industries in the near future. Illinois has large and varied industries, and is rapidly coming to the front as a clay-working state. Terra cotta, enamel brick, stoneware, art ware, paving brick, face brick, fire brick and fireproofing, sewer pipe, drain tile, cement and glass industries of Illinois are second to none, and the future will see white wares of all descriptions manufactured within our borders.

President Stipes: We would like to hear from Mr. Blair's comments on the subject of Mr. Purdy's paper.

Mr. Blair: Well, I don't know how to discuss that paper, I am not competent. I was impressed with this one thought, however, that in the main, pretty nearly all that we know about clay and clay burning we have learned largely by accident; and there are more things that we do know and are *unable* to account for, than there of the things which we know and *are able* to account for. We know that by experience. We don't know why this is so or why that is so, but only know that it is so; and the suggestions along the lines of scientific investigation with reference to the unsolved prob-

lems as well as the problems that are solved it seems to me are of the utmost importance to this business, and I am entirely pleased with the suggestions of the Professor looking to the investigations along these lines.

Now, I have no doubt that it is the experience of every man here that at one time or another—some time—in some way, there has been produced and turned out on his plant an extraordinary burning of brick. He was highly pleased, highly satisfied with the quality—with the large percentage of high grade ware; and yet, with the results all there before him, plain as the day, he was utterly unable to tell how such results were produced. Now, I undertake to say that this is one of the duties, that is one of the questions for the scientific schools, and what we pay our money for, and it is one of the cheapest bargains, one of the best expenditures of money that we ever make in any direction whatever. We want to know, in other words, "where we are at."

We want information as to why this occurs, and why that occurs, and how to produce, without guess or hap-hazzard, this or that much desired result. How very few of us know anything about heating! How very few of us know anything about gravity! Or about how to mix and temper! How many throughout the country, from one end to the other—how many perfect burnings or even very nearly so have there been secured in the last year from the various kilns throughout the State of Illinois! Scarcely any.

So, I cannot discuss the paper, Mr. Chairman; but I can only express my gratitude for and sympathy with the valuable suggestions contained in the paper. That is all I have to say. (Applause.)

President Stipes: Is there any other gentlemen who would like to say a word on this paper?

N. M. Mamer: Mr. Chairman, on the part of myself and others here, I would like to ask a few questions about that system of using the heat from the kilns in Monmouth for further purposes. Now, I understand they use the heat under the boilers, and from thence on through the buildings. I would like to have Mr. Purdy explain a little more fully.

Mr. Purdy: Withdraw the heat from the kiln for the dryer and direct it forward to the boiler. Raise it as it is needed in the drying-room, and pass it thence up to heat the building. This same plan has been tried by the Chicago Retort and Fire Brick Company, I believe, and they have a representative here. I would like to hear that gentleman's experience on that proposition.

George J. Dieterich: Our company tried this for a while, but it did not work satisfactory.

Mr. Purdy: I understand the trouble up there was this: they could not damper the empty kilns—the cold kilns—sufficiently so as to act as dampers on the flues through which they operated the burning kilns. Instead of burning six or eight days at most, they had to burn ten or twelve days—due to the cold kilns, especially as they would have to generate enough in the burning kilns to carry over to the boiler.

I know that this is a live question—the proper utilization of heat. Another one is producer gas and its use in the heating of the plant. I understand they have a producer gas man here this morning who has looked into this subject, and I have no doubt there are other ways to utilize the waste heat from the burning kilns for the heating of the plant.

W. B. Chapman: I don't know of any way of heating by means of the gas as it comes from the kilns—producer gas. It can be used for the water smoking of the next kiln, and used to good advantage when the kilns are arranged with that end in view. We have recently taken up the matter with the Fire-proofing Company at Perth Amboy, New Jersey, who make terra cotta. There they have four kilns a short distance apart, which they propose to use as one large continuous series. Of the four kilns, one is continually out of commission, either being empty or being charged up again. Of the three in use, one will be cooling down, another one firing hard, and the third one will be water smoking. Now, we take cold air from out of doors and put that in the kiln that is heating up; then that is carried to the next kiln that is burning hardest and from

there it is taken to the third kiln that takes the waste gasses as they pass off from the hot kiln: and that is the plan upon which they work out there, and while they have not perfected it, it is something they will undoubtedly do in the spring, as what has actually been done, if found advantageous, is bound to come into permanent use. Our experience and our opinions in this matter would lead us to reason on these lines.

As you take up the problem of heating your kilns, the first thing you might ask is, Who are the largest users of fuel in the world? Who use the most coal? And the answer comes, "The iron and steel people." Then, who are the people to whom we should look for lessons in the most economical methods of generating heat? The same answer. How do they generate heat? Without exception they use producer gas. Hardly one of them uses oil, there are just a few who use natural gas. Now, the next question comes, "Can producer gas be applied to your work—brick works or any of the clay works?" To my mind, it is merely a question of experimentation, and not along the line of the use of coal, as it might seem to some that it would be; because the use of gas for fuel is going into all kinds of lines. Some manufacturers of lime have adapted it to the manufacture of lime, and it has been found superior for that purpose to coal. "Oh, we don't use coal," said one of these lime men to me, "we use wood." When I suggested gas, he said he didn't know whether he could get heat enough from gas. He was induced to try the experiment of using gas, but we had to make the installation at our own expense entirely—we were to get no pay until it was established as a commercial success, "commercial success" in the sense in which that phrase is usually used. After four months' run, he wrote us for a duplicate for another plant. He is now saving twenty per cent on fuel, and I see no reason why results fully as good cannot be obtained in your particular line. One advantage is, gas itself does not discolor—that is one of the important points.

If you go into this matter at all, you will find different manufacturers of producer gas, one for use in engines and another for another use—for heating purposes, which requires an engineer. To produce gas for heating, an entirely different kind of still or retort is employed.

I would be very glad at any time to go into details with you and explain as to what we have done and what we are capable of doing in your own line, and I think I can show you that we can accomplish results similar to what we are already accomplishing in other lines of industry.

W. S. Purington: As a matter of course, producer gas is something in which we are all interested and perhaps I will have a little more talk with the Gentleman before we get through.

With regard to the work of the Association here, there is no question but all here realize the good that Professor Orton has done in Ohio, and hope we shall get like results in Illinois.

J. H. Millsom: Mr. President, I don't know that I can say anything—only that I am glad that the school has been started, very glad. Being a young man in the clay business, I want information, and if we can get it over at the school, I am going to have it.

President Stipes: We will next hear Mr. Warren Ittner, of Belleville, Illinois, upon "Economy in Steam Power." Mr. Ittner gave way yesterday to Mr. D. W. Gates.

Warren W. Ittner: I was extraordinary glad to be here at my first convention,—that is, my first state convention. I was upon the program yesterday to follow Professor Rolfe, and was very sorry of that. But I was put off until today; and then our Secretary, to encourage me, came around and told me we were going to have an expert engineer here from Chicago, and so he has got me again, and I don't know just how I am going to come out in the discussion after reading my paper.

ECONOMY IN STEAM POWER.

A discussion of this subject from the clay workers' point of view must necessarily resolve itself into a discussion of the questions he will ask when contemplating the erection of a new plant or the remodeling of an old one, viz.: What power shall I use, and, if steam,

what style of boiler and engine will be best suited to my needs, everything considered, and how can this power be used to the best advantage?

In making his decision, if he would arrive at some approximation of success, he certainly must needs consider everything. Not the everything his experience has taught him concerning boilers and engines, valuable though this may be, if his experience has been large, misleading it may be, if his acquaintance with steam and its appliances has been small; not the everything of his engineer, whose views are apt to be biased from too close contact with the trials and vexations of his particular engine in favor of the seemingly perfect and apparently unattended monster in the engine room of the local brewery. The engineer's idea, to install a miniature of this cross compound condensing outfit, is all right in a way, but then he knows nothing of the figure the necessary knowledge and attention to operate it would cut in the cost account of a plant making say twenty thousand brick per day, where the engineer is also boiler fireman, machinist, etc. Nor yet the everything of the expert, for skilled though he may be, he may not trouble himself to learn some of the most vital, though obscure conditions affecting your choice of boiler and engine. However, the solution of such problems is his business and it is only fair to say that his advice would be best to follow.

That, everything considered, means a thorough threshing out of what everyone knows, a careful review of all the facts and conditions governing the case and what is not of the least importance in aiding us to a decision, a visit to plants operating under something like similar conditions. It would be difficult to explain why clay-workers as a rule look upon this subject with indifference, if they give it any thought at all. It certainly is worthy of mature consideration. What method of power generation to install? If electricity, whether single or multiple units; if steam, whether elaborate economy or simple efficiency would best suit our purpose, and then its arrangement in connection with the clay plant as a whole. All of these are certainly questions of paramount importance in plant construction.

The question of the best method of power generation for clay-working plants does not come within the scope of this discussion. It alone is a phase of plant construction of first importance. However, before dismissing it, I wish to quote from the able and interesting paper read before the Ontario Clay Product Manufacturers' Association, at Hamilton, Ontario, by Mr. A. M. Wickens, chief engineer of the Canadian Casualty and Boiler Insurance Company. In reference to steam power versus all competitors, he says: "But where a man has heat to use or where a man has the opportunity to utilize heat, I think it is a long way between now and the time the gas producer or electricity or coal oil or gasoline will beat steam. Just as soon as we begin to study the use of exhaust steam, if we are going to get back the heat we put into steam after we have run our engine, it is going to keep all the new ideas working very hard to beat us very much. Just as soon as we begin to study and work out properly utilization of the waste that we are making from our steam, just so long are we going to keep the other fellow hustling." And in my opinion he is correct in this. We must have steam or heat in one form or another about a brick plant, whether to dry brick or heat dies, and if it is properly and economically generated, and its heat energy used to the limit, there will be few, if any, of the newer methods of power generation able to equal the result.

It would certainly be a pleasure to be able to formulate a table showing the type, horse-power, etc., of engines and boilers best to install in connection with clay manufacturing plants of various products and capacities. It may be that the impractical ones will be disappointed at not finding this data here. It is needless to say that they will look for such information in vain. All we can do, in fact, all our technical books or universities can do, is to teach us how to make the best of the conditions that govern. It is for the solution of these problems that our engineers are trained. An eminent authority, in an article along these lines, has this to say: "The adjustment of the ratio of expansion of the steam to the requirements of maximum efficiency is the vital problem of the designing engi-

neer and the purchase of the engine.—The accuracy with which the designing and constructing engineer determines the adjustment for maximum financial efficiency is a measure of his ability and skill and a gauge of his success in solving his problems. With each standard construction, experience usually enables the engineer to satisfactorily determine the proper solution of this problem."

It would be disappointing if, on account of feed water, or some other cause, we would have to reject an economical type of boiler in favor of one of lower efficiency, but better adapted to the conditions. To be sure, we can prepare most any kind of water for use in boilers, but suppose this water purifying plant were beyond our means or expensive to operate, thus annulling the saving made by the more efficient boiler. However, the mistake, in our profession, is much more often made the other way around. Regardless of the price of fuel, boiler water, horse-power required, and numerous other points of equal importance, we will install a steam power plant of the lowest efficiency, and install it carelessly at that. Why? Well, it is the cheapest and simplest, we understand it best, any one can operate it, we don't care about the looks as long as it does the work, etc., etc. At the same time there might be every reason for the most rigid economy; the most up to date steam plant, even though much more expensive, would pay a skilled engineer and a good interest on the investment by the saving it would effect. And saving, stopping the leaks, is the order of the day in our business even to a much greater extent than in any other line of manufacture. One of our oldest clay workers has said, "It is not what you make but what you save around a brick yard that counts," and there is nothing truer than this, any way you take it.

Now, as to the first part of my subject—what type of boiler and engine to install for plants of various size—aside from the particular conditions which would govern the selection, all we can do is to consider the various types. There are few instances where you will make a mistake by using some of the standard makes of watertube, internally fired or multiple-flue boilers. The primary idea is to use every heat unit contained in the coal you burn. In its development great strides have been made, however at certain sacrifice to cost of maintenance, strength, etc., but fuel must indeed be cheap to annul the saving thus effected. Indeed one of the accomplishments of the modern boiler is to burn cheaper or lower grade fuel. The coal mines of our state were used to employ the common cylinder boilers, or boilers with only two or three large flues. They were thought to be the only thing to use. Now our coal mines are installing the modern types, because the mine operators have learned that they use less fuel and steam can be kept up with the slack that formerly went over the dump. Certainly, if where fuel is the cheapest, it pays to install a high type of boiler, it ought to pay everyone else to do the same.

Now, as to engines, there is a much larger field for choice. You can get any kind of an engine you want, steam users, not to mention steam wasters, and steam savers. The requirements of the plant still govern the choice; if we are going to need large quantities of steam for some purpose or other, such as drying wares, it would be a mistake to install a complete steam-saving outfit. An efficient and less complicated engine will do, and we can make the saving by utilizing the exhaust steam. If, however, we want to develop power and will have no use for exhaust steam there should be no hesitancy in adopting the most economical outfit we can buy, consistent with the size of our plant, capital invested and the talent we can afford to employ to attend to its proper operation. Whatever type we adopt, it should be properly attended by some one who knows what he is about, if not by a competent engineer. The second-hand man, whose only accomplishment is a willingness to work cheap and put in all the overtime necessary to rectify the consequences of his bungling mistakes, belongs with second-hand machinery—on the scrap heap. Good machinery with a competent man to operate it will pay dividends in any plant, and if you cannot succeed by these means you cannot by any other.

The same writer from whose article I have already quoted, an eminent teacher of engineering, has this to say concerning the me-

chanical efficiency of engines and their adaptability to various industrial work. "Mechanical efficiency—the ratio of work transmitted from the piston to the point of useful application, ranges from 95% in direct acting engines as a maximum to 85% with the older non-condensing engines. It is made a maximum and friction reduced to a minimum by careful design and especially by securing constant, complete and free lubrication; usually, in the best cases, by a circulatory flow of oil, flooding the bearings and returned by pumps to the source, through a filter, to be again distributed to the rubbing surfaces of the engine. The lost work is less—as the pressures are higher within limits determined by the nature of the materials—as the lubricant is better adapted to its intended purpose and as the flow is more liberal where reaching the rubbing parts. The highest values of the coefficient of friction are often ten and sometimes twenty times the lowest and the careful attention of the engineer to this detail is always well compensated."

"The ultimate limit of economy in operation, with any class of engine, is fixed by financial considerations and the principle involved in determining the limit may be thus expressed: That engine is most perfectly adapted to its place and purpose of which the type is such that no practicable substitution will permit the supply of the demanded power at lower total operative costs, including interest on first cost, a sinking fund to provide for replacement at the end of its period of use and annual operating expense; and that size of engine is on the whole best, variation from which in the direction of either increased or lessened size will increase that total expense of operation. In the latter case, the gain by reduction of size will be more than compensated by the loss due to its reduced efficiency. The best engine is that which will give largest returns on the capital invested, adding most effectively during its life to the dividends obtainable from the plant of which it forms a part."

Reluctant as I am to leave the subject of engines and boilers for brick plants without having brought to light something of more definite importance, I will pass on and discuss a few of the abuses to which we see even excellent machinery subjected, and which are sources of loss of power.

Overloading—working above capacity, is one of the commonest abuses we see engines and boilers and machinery put to about brick plants. Where the economy lies in such procedure it would be difficult to say. In fact, such practice is the very opposite of economy. The average man, when he is running a boiler or engine or brick machine at 10% over its limit really believes he is gaining just that much. Arguments to the contrary seem not to reach him, but sooner or later he will be brought to a realizing sense of the truth of that assertion, and the lesson is likely to be dearly bought, for the machines are just the same as men or beasts, they do the best work and last the longest when not strained or overworked.

When you install a steam power plant make it large enough and to spare. Allow for a large surplus of power. The chances are that your machinery will take more power to drive than you have counted on and then again I never knew a brickmaker that was not making some sort of an addition to his outfit that would take additional power to drive. If you have surplus power you can do these things, while often you are balked in installing some really good labor-saving device by want of power to operate it. But over and above these considerations a reasonable surplus of power is a good investment.

As to the other numerous ways in which we waste steam and power, I am discouraged about discussing them, partly because Mr. Wickens, in his recent paper, from which I have already quoted and which you have doubtless read, has covered them so completely and forcibly, so much better than I could do, and partly from the fact that the subject has been threshed out so often before the various conventions that it is apt to become tiresome. About belting—it would seem that we ought to have learned by this time that a light, narrow belt, stretched like a fiddle string to make it pull, is poor practice. It increases friction to the extent of running journals hot, wasting power and lubricant and causes delays by breaking.

Why not have them wide and heavy? The closer between the centers of pulleys the wider and heavier they should be. Have the bottom belt do the pulling and the top hang slack so it will hug the pulleys and give a longer arc of contact on the pulleys; this obviates the use of a belt dressing to make them pull. Why run a twist or crossed belt when we can run them the proper way? A belt run with the bottom side pulling and the top side slack will outpull and outlast three crossed belts.

Improper alignment and poor lubrication are two great wasters of power and causes of trouble. It would be safe to say that more power is lost through these two causes than all the others combined. It takes no small degree of engineering skill to properly align shafting and machinery, and as for the lubrication problem that is notoriously unsatisfactory, especially where there is much dust. That so much power is lost by these two causes is no doubt due to the fact that they are not easy of detection; a journal run hot by a tight belt we can see and remedy, but we cannot so readily see that they are not being properly fed with oil, or that the shafting is binding in the journals from being out of line. To the eye they look all right and these conditions may exist for a long time before they are detected.

We meet our greatest power development and power transmission problems in remodeling an old plant. We are often hedged in by all but insurmountable problems. Often we find that, taking into consideration the expense we have been at, the more or less unsatisfactory result and the trouble we are sure to encounter in operation, it would have been cheaper and vastly more satisfactory to have built new. So it is that in making changes, repairing or remodeling, when we meet a difficulty it is well to remember that great and various improvements have been made in both power plants and power transmission appliances, and we should not neglect to study the adaptability of each and every one of them toward overcoming our particular trouble. If one does not furnish a solution to the problem, another might, perhaps the one we least expect it of.

As to the matter of insulating steam pipes to prevent condensation which is caused by the radiation of the heat or life of the steam through the iron pipe—it is simply a question of whether we want to make this saving or not. The radiation of heat is perhaps the largest problem in connection with clay burning and kiln construction; we pay due deference to it here. It certainly is an immense cause of trouble and waste in steam engineering, yet we overlook it almost entirely. To cover steam pipes with an inch or two of magnesia felt covering is good practice. By doing this we furnish dryer steam to our engines, which both relieves them and increases their efficiency. We burn much less coal and use much less water. A battery of overworked boilers may be relieved and even given a considerable surplus of power by this covering.

It will pay every clayworker to remember that his calling has reached the point where the growing competition and trade conditions will not permit him to install anything but the best and most economical. Invention and progress relegate things to the scrap heap soon enough. You may have a market for a time in which anything will do and in which anything will sell, but it will not last long and when competition comes you must be on an equal footing with the newcomers or give away.

President Stipes: We are all interested in power. This has been an excellent paper, and should be discussed.

Dr. Converse: I remember a piece in our old Readers, when I was a boy, "Combine Knowledge with Power," and I expect that is just as applicable in a brick yard as it was then.

I was interested in the paper. I thought, however, that the use of power was much better and more clearly treated than the source of power. The various modifications and adjustments of power, its regulation, etc., I thought were treated in a manner that was very clear and explicit. On the special pipes, connections, etc., and the arrangement of the parts that would prove most economical there was some treatment by the paper, and, it said, the best engine was the one that was the most economical; but he failed to give us an

idea of what engine was the most economical. It reminded me of the politician arguing to win votes in a campaign where the subject of physical education was prominent as a question in contest. He talked all around the subject, but seemed shy of coming to the point, until some one called out, "How do you feel on physical education?" As to what sort of engine is best for brickyard purposes I believe the paper contained no remark; nor did it upon the subject of high speed or slow speed—as to which is the best. I would like to learn a little on engines. There is a great deal said on the firing of engines, the manufacturing of steam, and of the different kinds of engines. But on the subject of one kind of engine being adapted to one kind of work and another to another kind, I would have liked it if he had been a little more definite. But two-thirds of the paper, and wind-up were admirable. It's just what everybody wants to know, the proper adjustment of parts, the proper use of belting, etc., to make the work of the engine a success. It might have been a little more definite upon the sort of power to use, and how to use it.

Mr. Ittner: Mr. President, the very point of which Dr. Converse speaks—the best type of engine to use, is really a hard matter to make absolutely definite. I could not very well make a table measuring the different varieties of horse-power, speed, etc. It is impracticable—could not be done. The type and form are governed by conditions, and varies with the product you are going to turn out, and there are so many different conditions that you absolutely could not tabulate, such a variety of phases.

Engine building has taken great strides within a short period, and is taking them now. They are building engines now that are much more economical in the steam used and in the cost of making it, the development of power, etc.

It is universally recognized that the higher speed, within limits, is the best. But you can go so far in the development of speed that you increase the cost of maintenance and repair very much, and the point is just where to stop, which, of course, is governed altogether by conditions surrounding—conditions under which the engine is to operate.

Then, the pressure: High boiler pressure is desirable. The higher the working pressure, the more economical the engine is. And from the boiler where the steam is created to the point where it is brought into use there are numerous devices for insulating the pipes forming the connection by which the efficiency of the steam is greatly increased, making the steam go further and requiring the burning of less coal for the development of a given amount of power; and the question of these needs has to be worked out according to the plant you are remodeling or rebuilding. I don't know that I can do better than to quote the language of an engineer connected with one of our colleges, who, in summing up a discussion on engines, said that the engine was the best which helped most to make a plant pay. It might be one that if changed and set up in another plant would be entirely unsuitable. And the engine itself might be wasteful and use an immense amount of steam; but if they should put in a higher type of engine, they would have to employ experts to run it, and continually employ more help, and in other ways contribute to retarding the dividend paying merits of the plant so that the use of a lower grade of engine not requiring the employment of high-grade help, would be regarded in reality the most economical for that particular plant.

From a consideration of some of these questions, the doctor, perhaps, may see how I might be excused from going into the subject more closely.

S. J. Shaw: Neither the Doctor nor Mr. Ittner has brought out this particular point—that the size of the plant has very much to do with the choice of an engine. Now, for a man operating a plant requiring, perhaps, twenty-five or fifty horse power, the common slide-valve engine is about as economical an engine as he can use. For a man with a larger plant, requiring a much higher horse-power, it is cheaper for him to use a Corliss Engine—something very high in efficiency—and from such an engine, also, he can use not only the steam but also the waste heat; but for a small plant, where the

utilization of waste heat comes from the exhaust steam, it seems to me that the ordinary slide-valve engine is as good as any. But in a large plant, where there is a great consumption of steam, developing four or five hundred horse-power, taking the percentage of heat escaping from the engine from the exhaust steam going out into the atmosphere, it is possible from the great saving here upon the higher class engine to make a big dividend on the investment.

Now, with reference to high speed: Some will tell you that the slide-valve is quite as economical in the use of steam as the Corliss. However, I have taken occasion to notice, being interested in two electric light plants, one of which is using a high-speed engine of the slide-valve variety, the other an engine of the Corliss type. The consumption of power is not materially different in the two plants. I think one plant requires an average of about fifty horse-power, the other something like sixty—that using the high-speed Ideal Engine; I know this, however, in the plant using the Ideal Engine the fuel consumption is just double that in which the Corliss type of engine is used. The boiler conditions are just about the same—tubular boilers 16 feet long—and one plant uses just about twice the fuel that the other plant does. The plant using the Corliss type of engine pays dividends, the other has not for nine or ten years. Of course this Ideal Engine may not be operating under ideal conditions, the conditions may be bad. But that is my experience in nine or ten years.

Mr. Ittner: I can corroborate that. We have two plants. In one we have a 125 horse-power slide-valve engine, and in the other a 90 horse-power Corliss Engine, made in Canton, Ohio. The arrangement of the boilers is entirely the same—the arrangement of the boiler running the Corliss Engine, perhaps, is better, on the whole, than the one running the slide-valve engine. In the matter of the use of steam, both engines are fairly economical, and are of about the same efficiency; but the difference in the amount of coal used for those two engines is phenomenal. For saving steam and utilizing the steam used, take the Corliss Engine. Regulate the valve properly to control the steam. The valve can be changed more or less by the lengthening of the lever-arm one way or the other. The difference in the fuel consumption between the two types of engines, developing the same horse-power, is very great. Now, this winter I am speeding the slide-valve engine up, putting in a fly-wheel that will give it about fifteen more revolutions a minute, cutting down the steam and covering every steam-pipe in this one plant. I inspect the boilers practically every week for the amount of steam used, and I think when we get through we will have the thing in fairly decent shape.

But another thing we want to speak about is the small engine. The thing to do is to consider every type, of course; but in my opinion, when you want to develop thirty-five or forty horse-power, the upright engine is the type to use. The horizontal engine is all right for a very high horse-power, but the upright engine has a very fine balance of valves, and all in all, is a very economical engine, and does not take up much floor space.

We have a machine shop in Belleville, a recent, new, modern shop, and they have put in the Freeman Internal-Fire Boiler. I called them up a few days before this convention and asked them how they were getting along with it, and they said they were very well pleased with it. It is an expensive boiler, and a man putting in a small brick plant might not feel able to buy that boiler, but when a high price is being paid for fuel, it does not take long to realize from the money saved in this quarter the amount of the difference in price, and he cannot afford not to buy—I mean, not the Freeman boiler, but some such type of boiler—so as to not only save fuel, but to cut down floor space.

The Ideal takes up floor space of about nine by thirteen feet for about 150 horse-power. Our two boilers take up 13 by 20 feet, setting and all, and we have 150 horse-power. They tell me of a shop having three engines, one of forty-horse-power, that runs the shop, a forty horse-power operating an upright air compressor, a twenty-horse-power operating the electric lights—and doing all

this with one boiler, frequently running all three engines at the same time.

A man starting a brick plant will sit down and write to the boiler people and get the price, and looking at the figures will just simply turn and throw the communication in the waste basket and not investigate further. There is where he makes a mistake. Very likely he will look around and get a second-hand boiler from some old clay man, an old type of cylinder boiler that will consume high-priced fuel and just simply eat him up, while another man, putting in a type of high-grade boiler, and a good engine, will make more—a larger percentage—right from his boiler and engine alone than the other will make from his whole plant. The thing to do is to consider everything.

Mr. Shaw: Speaking about the Internal-Fire boiler, my friend who is in the coal mining business has an Internal-Fire boiler—a Marine boiler. That is it that you refer to?

Mr. Ittner: No, one large boiler—one large-flue boiler, I think sixteen feet in diameter and nine or ten feet long—somewhere about those proportions.

Mr. Shaw: This Marine type boiler, some three or four years ago, was thought to be the proper thing to put in. My friend bought a boiler of the Marine type. I think the boiler he bought was something like a ten-foot Internal-Fire boiler, with return flues at the top. I was down there one day and the boiler was leaking very badly. It had been installed about a year. Now, what was the matter with this Marine boiler? Hold your hand on the bottom of the boiler and it was just comfortably warm. On top, of course, it was just as warm as any boiler.

The trouble with the Internal-Fire boiler now-a-days is that they don't get the same heat on top as at the bottom, and this trouble has never been explained. Very soon the boiler leaks. Yet the time was when a man couldn't run fast enough to get a marine boiler.

Of course this trouble, in some of the smaller boilers, might be overcome. The boiler Mr. Ittner describes is probably of the Marine type, and I imagine that a man buying that kind of boiler will get as much trouble as he is looking for—that is the true Marine type for use in a stationary plant.

I was talking with an engineer on the Mississippi River once about this kind of boiler, and he said that one serious objection was that in the Marine type of boiler you get much more heat on the sides than you do at the bottom, and on account of leaks, probably due to uneven expansion, it was a matter of being in the shops about once a year, and requiring constant repair.

I think that the ordinarily favored old fire horizontal, tubular boiler and perhaps, round-top boiler, most advantageous.

Mr. Ittner: Along that line he is correct,—the Marine type of boiler being splendid for marine service. Buy the Moore Boiler, or the Babcock & Wilcox, in which the water tubes of the boiler are directly exposed to the fire circulation. The improved boilers of this type carry but a small amount of water, and hold the steam, and that explains why the Marine type of boiler is best for marine service. They have had a great amount of trouble with the Internal-Fire boilers on that account—uneven expansion. I simply cited this machine shop's experience, as throwing some light on the subject, as a shop in which they have thus far experienced no trouble with the Internal-Fire type of boiler, and whether any such trouble will come to light and develop will simply have to be demonstrated by the flight of time. But it is true, the boiler in use there is a very good boiler, and is of a type that is about the best for engine service.

Mr. Mamer: Mr. Chairman, regarding the Marine type of boiler as a water-proof boiler, I think the one that Mr. Ittner spoke of comes nearer to being water-proof. He speaks of a boiler, (and people sometimes ignorantly call it the Marine type of boiler), that is a little longer and less in diameter than the average marine type has been. Now the unevenness in expansion and contraction is a difficulty that is not confined exclusively to this class of boiler; it is met with also in the long, tubular boiler. And while it is true

that you will sometimes find the internal furnace boiler twice as hot on the top as on the sides, I have seen the tubular boiler, sometimes, become three or four times as hot on the ends as on the sides. Of course, with the boilers that are in use now, that is not so much the case. But, nevertheless, there is some difference in the temperature of the sheets upon different parts of the boiler, and this is pretty nearly as true of your tubular boiler as it is of your internal-furnace boiler. That Commonwealth Electric Co.'s plant at 22d Street, Chicago, makes use of those internal-furnace boilers exclusively, and I guess that is the biggest steam plant in the United States.

If properly constructed, the internal-furnace boiler is really the cheapest, because it takes no setting and the cost of the boiler is all there is to it; and, as near as I know, the cost of the internal-furnace boiler, as compared with that of the corrugated furnace and tubular boiler, runs 60 to 100, or about in that neighborhood.

President Stipes: The next number on our program is "Sewer Pipe; Its Properties and Requirements," by Professor A. N. Talbot, Director of Department of Theoretical and Applied Mechanics, Urbana.

Professor Talbot: Mr. President and Gentlemen of the Association: I desire first to give credit for the greater part of the work in the preparation of this paper to Mr. Slocum, Instructor in Sanitary Engineering. The paper deals with the Requirements of the finished product, and of course does not go into matters connected with the manufacture of sewer pipe.

SEWER PIPE; ITS PROPERTY AND REQUIREMENTS.

Vitrified clay sewer pipe by reason of its many excellent qualities is used extensively in sewer construction. It is easily and quickly laid even under adverse conditions. It resists the wear of the stream, is proof against chemical action, and because of its smoothness and its non-absorptive properties forms a sanitary channel. The manufacture of clay pipe by machinery dates from about 1810, and since that time many forms have been tried. Only the bell and spigot pattern will be treated in this paper.

Vitrified pipe ranges in size from an internal diameter of 4 in. for house connection to 30 and 36 in. for the larger sizes. The thickness must increase with the diameter of the pipe, since the larger size carries a greater load upon it and also because the greater span would require more thickness to carry even the same load. What the load formed by the backfilling in the trench will be is difficult to judge, and the strength of sewer pipe under conditions it will be subjected to in the trench is not well determined. Some experiments made by Frank A. Barbour, reported in the Journal of the Association of Engineering Societies, may throw some light on the breaking strength of such pipe. The tests were made by placing the pipe in a trough partially filled with earth, the pipe was covered with earth and the mass subjected to pressure by a hydraulic cylinder. Standard and double-strength pipe were tested. The following formula for breaking load and thickness of shell were deduced from the experiment:

$$P = c \frac{t \cdot 1.65}{d} \quad \text{or} \quad t = 1.65 \frac{Pd}{c}$$

P is the pressure in pounds per lin. ft., t the thickness in inches, d the diameter in inches and c a constant equal to 33,000.

The pressure in pounds per lin. ft. carried by pipe and the value of P from the formula are compared in the following table:

Size In.	Thick- ness In.	Standard		P	Thick- ness In.	Double- Strength		P
		Lb. Lin. Ft. Actual.				Lb. Lin. Ft. Actual.		
6	0.69	2610	3010	....	....	....		....
8	0.82	2900	2980	....	....	....		....
10	0.83	2830	2440	....	....	....		....
12	1.02	3230	2860	1.26	3920	4030		
15	1.18	3210	2890	1.40	4560	3860		
18	1.29	2680	2790	1.54	4150	3740		
20	1.31	2580	2560	1.74	4120	4110		
24	1.47	2550	2500	2.02	4330	4380		

Some years ago experiments were made in the Laboratory of Ap-

cause eddyings and cross currents as well as retard the flow next to the pipe surface. The effect of these roughnesses is represented by n in Kutter's formula

$$(C = \frac{41.6 \times \frac{0.00281}{s} \times \frac{1.811}{n}}{1 \times (41.6 \times \frac{0.00281}{s} \times \frac{1.811}{n})})$$

for c and is commonly taken as 0.013 for pipe sewers. The values in the following table, for velocity in feet per second, discharge in cubic feet per second and discharge in gallons per minute for pipe flowing full are based on " n " equal to 0.013 and a slope of 1 in 100.

Dia. In.	Vel. Ft. Sec.	Discharge, Cu. Ft. Sec.	Discharge, Gal. Min.
6	2.46	0.48	220
8	3.10	1.08	490
10	3.69	2.01	950
12	4.26	3.35	1500
15	5.04	6.19	2790
18	5.78	10.2	4600
21	6.47	15.6	7000
24	7.15	22.5	10100
27	7.78	30.9	13900
30	8.38	41.7	18800
33	8.97	53.3	24000
36	9.54	67.4	30300

Plate I shows the same information in graphical form.

It is not common to have grades as steep as 1 in 100 (gradient=0.01) and for the flatter grades multiply the velocity in feet per second or discharge in cubic feet per second by 10 times the square root of the desired gradient. The following table gives the coefficients by which to multiply the velocity and discharge of the preceding table to get values of velocity and discharge for new gradients:

Gradient—

Coef. for new Grad.—

1. .82 .71 .58 .45 .365 .32 .283 .26 .24 .22

Plate II shows the value of the coefficients by which to multiply the value of the velocity or discharge found with $s=0.01$ to get the

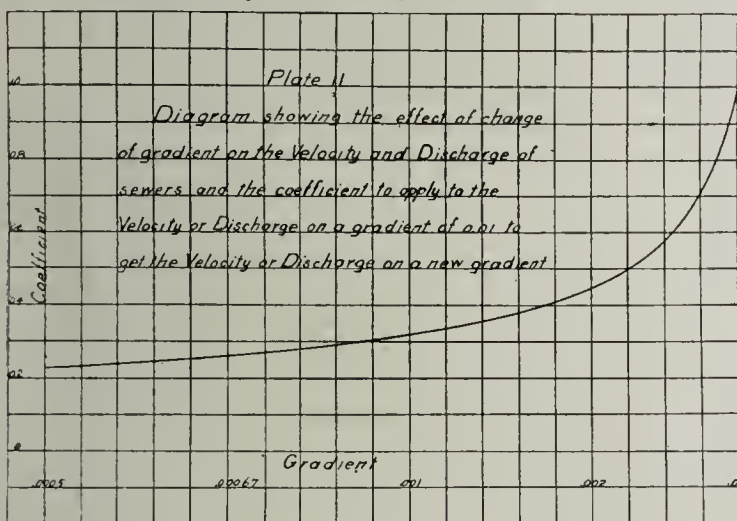


PLATE No. II.

velocity or discharge with a new gradient, s . Example:—If $s=0.001$ and the pipe is 10 in. in diameter then using Plate II, the coefficient is 0.32 and from Plate I the velocity is 3.7 feet per second, and the discharge is 2.0 cu. ft. per sec. Therefore the velocity in a 10-in. pipe flowing full on a grade of 1 in 1000 is $3.7 \times .32=1.18$ ft. per sec., and the discharge is $2.0 \times .32=0.64$ cu. ft. per sec.

As noted above, the flow in pipe sewers is commonly stated to be that corresponding to a value of " n " in Kutter's formula of $n=0.013$. The statement is frequently made that pipe sewers of large size have a larger discharging capacity than this. Catalogs of several sewer-pipe companies have contained statements similar to the following. "All authorities agree that these pipe has a carrying capacity of 50 per cent over that of brick sewers of the same size." The writer wishes to raise the question whether there is any foundation for this statement, and whether a value of .013 in Kutter's

formula is a correct estimate of the discharging capacity of pipe sewers. Sewer pipe usually have a smooth surface. There is, however, a difference in diameter in adjacent pipes—perhaps as much as half-an-inch or even more in pipes from 24 to 36 in. diameter. The projections thus formed and especially the changing area of cross-section of the stream from pipe to pipe add greatly to the resistance of the flow. It is a well-established fact in hydraulics that changing areas of cross-section consume head or fall. The loss in changing from one pipe to another may not be much, but with 2000 or 2600 changes per mile the cumulative effect of even small differences in diameter is noticeable. Experiments on a well-laid and clean 18-in. pipe sewer on a grade of 1 in 1000 indicate that a flow larger than that given by Kutter's formula with $n=0.015$ cannot be relied on and other observations indicate that this is as large a discharge as can be expected in pipe of this size and larger. This quantity is about 17 per cent less than that given by the foregoing tables. The capacities claimed for large pipe sewers must then be said to be exaggerated, and it is even possible that a well-built brick or concrete sewer may have as great a carrying capacity as a pipe sewer of the same size, or even greater.

The capacity of a sewer, for all practical purposes, is greatest when flowing full. The relation of velocity and discharge when flowing part depth to the velocity and discharge when flowing full is shown in the table on this page.

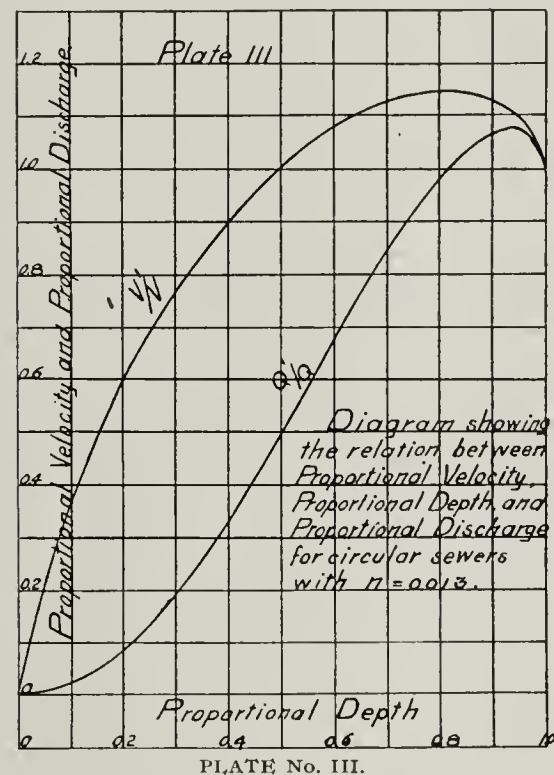


PLATE No. III.

Depth of flow in terms of full depth.	.100	.250	.330	.500	.670	.750	.815*	.935*	1.00
Velocity Coef. ...	.370	.695	.810	1.000	1.112	1.135	1.142		1.00
Discharge Coeff. ...	.019	.135	.232	.500	.795	.913		1.077	1.00

*Theoretical maximum. Plate III shows this in graphical form.

Suppose the 10-in. sewer on a grade of 1 in 1000 flows only to a depth of 0.67 (2-3) the diameter of the pipe, then from the table above the velocity is 1.11 times the velocity when flowing full (1.11×1.18) or 1.31 ft. per sec., and the discharge is 0.795 times the discharge when flowing full (0.64×0.795) or 0.51 cu. ft. per sec.

Sewer pipe and specials which meet the following requirements may be expected to satisfy both engineer and manufacturer.

(a) All pipe shall be of the best quality of salt-glazed vitrified clay sewer-pipe of the hub-and-spigot pattern. The pipe shall be hard and thoroughly burned and be well and thoroughly salt-glazed inside and outside.

(b) The body of the pipe shall have a uniform thickness of not less than one-twelfth (1-12) of the internal diameter for all sizes up to and including 12-in. diameter and for other sizes the minimum thickness shall be that shown below.

Dia. of pipe, ins.	15	18	21	24	27	30	33	36
Min. thickness, ins. . .	1 1/8	1 1/4	1 1/2	2	2 1/8	2 1/4	2 3/8	2 1/2

(c) No pipe shall vary from straight more than 1/8-in. in a length of 2 ft. No pipe shall lay less than 2 ft.

(d) At least 40 per cent of all the pipes and specials 12 in. and upwards in diameter, and at least 60 per cent of all 10 in. and less in diameter, must be substantially circular in cross-section. Pipe with an elliptical, oval, or egg-shaped cross-section shall not vary in any two diameters more than 1-24 of the nominal diameter of the pipe. Pipe with cross-sections which exhibit angles, sharp bends, or flat places that cannot be placed in the top one-third of the circumference under the specified conditions for laying shall be rejected. The area of cross-section of the pipe shall in no case be less than that of the specified diameter.

(e) All hubs or sockets shall be of sufficient diameter to receive, to their full depth, the spigot of the next following pipe with no chipping of either and leave an annular space at any part of the circumference not less than 3/8 inch and give a smooth and continuous invert. The depth of hub shall not be less than the following:

Dia. of pipe, ins.	6	8	10	12	15	18	21	24	27	30	33	36
Depth of hub, ins.	2	2 1/2	2 1/2	3	3	3	3	3	4	4	4 1/2	5

(f) Pipe having fire cracks which exceed any of the following limits shall be rejected. (1) A single fire crack, which extends through the thickness of the pipe shall not be over two (2) inches long on the spigot end or over one (1) inch long on the hub end of the pipe. (2) A single fire crack which extends only two-thirds through the thickness of the shell shall not be over four (4) inches, if on either end of the pipe. (3) A single fire crack which extends only one-half through the thickness of the shell shall not be over six (6) inches long, if on either end of the pipe. (4) A single fire crack which extends less than one-half through the thickness of the pipe shall not be over eight (8) inches long. All firecracks included in (1) to (4) shall be measured in the direction of the length of the pipe. Pipe having two or more of the above-listed fire cracks shall be rejected. Pipe having any of the above listed fire cracks which can not be laid 40 to 50 degrees from the top shall be rejected. (5) A transverse fire crack shall not be longer than one-sixth of the circumference of the pipe nor extend more than one-third through the thickness of the shell. Two or more such cracks shall be cause for rejection. (6) No pipe shall be accepted which has in it a fire crack 1/8 in. or more in width at any point.

(g) Pipe having cracks other than fire cracks which extend through the shell, due to transportation, cooling, frost, or other cause shall be rejected, regardless of the length of the crack.

(h) Unbroken blisters on the inside of the pipe two (2) inches or more in diameter and one-quarter (1/4) inch or more in height shall be rejected: Pipe having unbroken blisters less than two (2) inches in diameter and less than 1/4 inch in height shall be rejected unless the pipe can be laid with every such blister in the top one-third of the circumference.

Pipe having a broken blister or flake on its interior surface which is thicker than one-sixth (1-6) of the nominal thickness of the shell and whose largest diameter is greater than one-fourth of the inner diameter of the pipe, shall be rejected. Pipe having a smaller broken blister or flake which can not be placed in the upper one-third of the circumference, in laying, shall be rejected.

(i) A pipe, which is not injured in the body but has a piece broken out of the hub, leaving a gap of more than one-tenth (1-10) of the circumference of the hub and more than 4 inches in length and which can not be properly laid with this gap in the upper one-third of the pipe shall be rejected.

(j) All requirements for pipe in so far as possible shall apply to specials. Specials shall substantially conform to the degree of curvature and general dimensions that may be required.

A. W. Gates: You say that the experiments made by Mr. Barber do not seem to be entirely trustworthy under conditions obtaining in this part of the country, where the filling of trenches is usually done by flushing with water. While it is true that the pressure of the filling upon pipe laid to a depth of five or six feet might not be to such an extent as to injure the pipe, yet, when it comes to filling the trench by flushing, I imagine that the weight of the filling transmitted to the pipe will be almost doubled.

I have found in a considerable amount of sewer construction that the cases of broken pipe ordinarily occur only when laid in trenches in hard ground, hard soil. Pipe that are laid in sand will very seldom be found to be broken. The explanation of this will be found, I think, that in laying the pipe in trenches that have been cut in hard soil, it is almost impossible to pack the filling under the lower portions of the pipe, so that there is lacking a support which would come from packing and filling evenly below and at the sides, so that the pipe, under this defective filling, is allowed to spread out and crack at the top and bottom and at the sides.

Some years ago we had a contract for fifty or sixty miles of pipe, requiring six weeks for laying. The pipe was all inspected by the City before it was accepted. Nine years after completion, the pipe, which was 18-inch, requiring replacement and repair at some points along the line, we were required to do the work. Here and there we found the pipe broken, and, with one exception, the broken pipe was found in very hard clay, requiring the use of the pick to get it out. One place, where the pipe was laid on the edge of the filling, the whole bank had slid over and about 125 feet of the pipe was broken, although none of it was rendered entirely useless. All of the pipe taken up was found to be broken at the top and sides, and to have spread out. The remarks of the Professor relating to inequalities of the strain resulting in the spreading of the pipe recalled to my mind the circumstances of our sewer-pipe laying under this contract.

With reference to the specifications which the Professor cites, I would say that I believe that these are more liberal than we generally find, and it seems to me that pipe that would not pass these specifications ought not to be used. In a great many cases they are more strict than seems to have been laid down in these specifications.

W. P. Blair: Mr. Chairman, one thing that has not been brought out in the Professor's paper to a degree of very great distinctness is the ground, (which all sewer pipe men ought to know and to understand), upon which the sewer pipe men are being fought by certain organizations all over this country; and I have myself from time to time listened to discourse on this subject, which is so akin to the abuses to which the paving people are subjected, that I have been deeply interested. And this fight has been waged in this country on the part of a class of people who are highly intelligent. Perhaps there has been found upon the desk of every councilman in the country a circular from some one of the Municipal Improvement Leagues, particularly is this true in Chicago, urging against the use of sewer pipe made by the clay men, because of their inability, as they, (the authors of the circular), claim, to make a perfect joint. Now, the Professor passed rather lightly over that point, but it impressed me very much as a point that ought to be taken care of by the manufacturer. City electricians in this country recommend, instead of sewer pipe, iron pipe—advocate it pretty nearly all over this country—for connection between house and sewer. Now, that prejudice being wiped out, you can see at once that its influence on the sewer-pipe industry would soon be felt all over the country. I merely call attention to that fact at this time, because it seems to me that people ought to be awake to the fact of the necessity of insisting and demanding that the joints be properly cemented for the users, as one means of combating the efforts that are being made to supplant the use of sewer pipe throughout the country.

Professor Talbot: I may say another word upon what Mr. Gates said concerning the experiments of Mr. Barber. It should be remembered that the conditions under which he expected to apply them, as I understand him, were not that the pipe should be filled by

flushing with water the trench in which it is laid so that there should be practically hydraulic pressure such as would be applied to iron pipe, but rather laid so that the pressure would be little if any more than would come from loose filling—that is one of the extremes of the conditions. The other extreme is, to have plenty of clay mixed with water, and filled in so as to give an approximately uniform pressure over the full length of the pipe, as well as around the outside circumference or surface. Under these circumstances, we might expect the pipe to withstand a much higher pressure than the boiler flue having external steam pressure; and the boiler will stand a good deal more pressure if the weight is on the top than if upon the bottom. We understand that in case of loose filling, improper bedding, and no lateral support, the conditions would be most destructive. Of course, if we get a combination, as Mr. Gates suggests, of a full support below, avoiding large pieces in the filling, back filling sufficient, and filling from above in such a way that too much water will not get to the bottom of the trench, we will probably have the best results.

Mr. Blair refers to the matter of joints for sewer pipe. That is the worst thing connected with sewer pipe. In order to make the pipe impervious, get the best cement that is possible to be had; and yet the joints will be poorly made. I don't know any good way, under ordinary conditions of construction to better this plan. Of course, if we had good conditions, we could make a fairly good joint.

Referring to the matter of the agitation against sewer pipe and the preference for iron pipe, I think that refers to pipe within houses rather than to pipe outside.

Mr. Blair: I have heard the lecturer employed by the Chicago Improvement Association deliver lectures, in the course of which he declared that there were objections which covered not the inside of the house only, but to the middle of the street, and throughout the sewer pipe of the main line.

Professor Talbot: To show that it is difficult to make such a joint and make it tight, I would say that when I built my own house I wanted to put drains around it to carry away the water from the roof. I employed a man who was a capable drain layer, and gave him every opportunity to make a good job. In order to test the pipe after the cement had had a chance to set, we plugged up one end and filled the pipe with water under no head, and we found a great many points of leakage. Surely, if under those conditions, leaks would be found, if there was any chance for settlement afterwards, leaks would come.

It seems to me that Chicago—and this is not against sewer pipe either—is far behind the times in allowing the use of sewer, vitrified pipes within the limits of the house for making sewer connections. There is not a town of eight thousand people in the State of Illinois at least, that has grown up to the putting in of sewer pipe in recent years that would permit of that construction.

Mr. A. W. Gates: Referring to the question of joints, I will admit that it is very hard to make a perfect joint in the cement laid pipe. In the small sized pipe I presume it could not be done without extraordinary, extreme care.

I just wish to say that some four or five years ago, I sold some pipe that was in a contract for a city in Iowa. This contract called for the construction of a sewer. About two miles of it, as I remember, was up a creek bottom, that is, through the valley of a creek which was from 100 to 500 feet away. The creek was very crooked, and the sewer crossed it a total of about 13 times, and I think was, on an average, about three feet below the surface of the street. This would develop about as bad conditions as could well be, as the excavation was for the larger part in the rock, and the balance in gravel. The engineer was what we all called a "crank," and he insisted on the contractor pumping every bit of water from the trench and keeping it out for twenty-four hours after the pipe was put in, and taking a small trowel and cementing the joints inside as well as outside. After the work was completed, about two years after starting it, I chanced to be there when the council accepted it, we went to the lower end of the sewer and found the total leakage in the

two miles amounted to enough to make one and one-half inches depth of water in twenty inches of length of pipe at the outlet,—which would be almost nothing for that distance. Mason City got a good job, and the contractor was "in the hole" to the extent of \$10,000.

Mr. Blair: Mr. Chairman, it is not my wish to provoke discussion, but I will say this; that while it is a pretty live subject to some of our manufacturers, the joint ought to be made and can be made, and it don't take much skill to make it. Why, it is but a little while ago—a year or two, perhaps—when it was considered quite difficult to make a curb of concrete—a concrete cement curb. Some ingenious fellow came along and made a form, and a couple of men now will skin out five or six hundred feet a day without any trouble at all.

Now, all that is necessary is to construct a little form for the joint, mix the cement properly and run it in, and you will have a joint that will outlast any iron pipe that was ever buried in the earth. (Applause).

J. H. Millsom: I know that making a joint in a sewer pipe line is pretty hard to do, but I had a little experience that convinced me that it could be done. Some six or seven years ago, a company that I was connected with had an irrigation pipe line to supply out in Kansas, and we had to make and lay a number of water pipe. To make the joints, we secured lugs to each end of the pipe section; between the pipe and lug we put rubber gaskets, and cemented the two sections of pipe together, using good Portland cement, which we poured into the sockets. After it was done, we applied a hydraulic test of 200 pounds, and they never showed a leak. That piece of pipe is standing today, and the job was a success. (Applause).

(The meeting was adjourned to the 3d session, set for the afternoon of Wednesday, January 24th, 1906.)

1906 MEMBERSHIP OF THE ILLINOIS CLAY- WORKERS' ASSOCIATION.

1. John W. Stipes, Champaign.
2. E. R. Frazier, Chambers Bros. Co., Chicago.
3. Geo. H. Hartwell, "Clay Record," Chicago.
4. W. D. Gates, American Terra Cotta & Ceramic Co., Chicago.
5. H. de Joannes, "Brick," Chicago.
6. G. C. Stoll, American Clay Mchy. Co., Wheaton.
7. C. W. Raymond Co., Dayton, O.
8. Geo. F. Beardsley, Champaign.
9. D. C. Haeger, Dundee.
10. John M. Heckard, M. Heckard & Sons, Canton.
11. J. W. Heckard, M. Heckard & Sons, Canton.
12. Geo. B. Roller, Canton.
13. Frank J. Kanne, Kanne Bros. & Co., Peoria.
14. Joe Watts, Newton.
15. D. M. Duddleston, Stewardson.
16. F. R. Carter, E. Peoria.
17. D. O. Loy, Wataga.
18. J. W. Powell, Indiana Drain Tile Co., Brooklyn, Ind.
19. Kerm Shrum, Salem, Ind.
20. Mrs. Kerm Shrum, Salem, Ind.
21. J. W. Stipes, Jr., Sheldon Brick Co., Champaign.
22. H. H. Thomas, Oblong Mfg. Co., Oblong.
23. H. J. White, Shaw, White & Co., Vandalia.
24. J. J. Gledhill, E. M. Freese & Co., Galion, O.
25. E. L. Hess, Dry More System, St. Louis, Mo.
26. S. J. Shaw, Shaw, White & Co., Vandalia.
27. A. F. McAfee, Ohlman.
28. C. A. Pech, Buckeye Pottery Co., MaComb.
29. S. W. Rawson, Troy Pressed Brick Co., Troy.
30. J. L. Hull, Cambridge.
31. L. H. Martin, Dwight.
32. C. L. Martin, Dwight.
33. Joseph Riehle, Auburn.

34. Ross C. Purdy, Champaign.
35. R. O. Lovett, Sheldon Brick Co., Champaign.
36. John W. Anderson, Jr., Wallace Mfg. Co., Frankfort, Ind.
37. Geo. I. Dieterich, Chicago Retort & Fire Brick Co., Chicago.
38. Walter M. Pratt, Earlville.
39. Mrs. Walter M. Pratt, Earlville.
40. Warren W. Ittner, Anthony Ittner, Belleville.
41. J. D. Jensen, Jensen & Zoeller, Pekin.
42. Chas. Zoeller, Jensen & Zoeller, Pekin.
43. E. F. Lampitt, Lampitt & Co., Pekin.
44. R. A. Stipes, Sheldon Brick Co., Champaign.
45. Dr. S. Russell, MaComb.
46. Peter Munson, Munson Bros., Ohio Station.
47. H. J. Votah, J. D. Fate Co., Plymouth, O.
48. H. E. Shaw, Bement Brick Co., Bement.
49. E. F. Anderson, Sheldon Brick Co., Champaign.
50. J. M. Gearhart, Sheldon Brick Co., Champaign.
51. J. W. Furby, H. Barnes, Onarga.
52. Geo. J. Walter, Chatsworth.
53. W. S. Barnes, Onarga.
54. Frank W. Butterworth, Western Brick Co., Danville.
55. Foster Bain, Champaign.
56. Dr. A. L. Converse, Springfield Paving Brick Co., Springfield.
57. C. W. Rolfe, Champaign.
58. A. Barr, Urbana.
59. H. Keller, Sheldon Brick Co., Niles, Ohio.
60. F. F. Bentley, Ohio Galvanizing & Mfg. Co., Niles, Ohio.
61. Charles Burridge, H. Brewer & Co., Tecumseh, Mich.
62. H. B. Fox, Urbana.
63. A. E. Giles, Peoria.
64. H. E. Simpson, National Brick Mch Co., Chicago.
65. D. E. Morey, Ottumwa Brick & Con. Co., Ottumwa, Ia.
66. C. C. Barr, Barr Clay Co., Streator.
67. Percy Brubaker, Dwight.
68. B. F. Roberts, Eagle Iron Works, Des Moines, Ia.
69. Geo. W. Seward, Seward Bros., Mason City.
70. H. H. Seward, Seward Bros., Mason City.
71. Louis B. King, Sheldon Brick Co., Champaign.
72. Wm. Hammerschmidt, Lombard Brick & Tile Co., Lombard.
73. J. S. Hutson, Sheldon Brick Co., Champaign.
74. J. R. Swan, Manhattan Rubber Mfg. Co., Chicago.
75. J. M. Mamer, Mamer Bros., Campus.
76. T. A. Randall, "Clay Worker," Indianapolis, Ind.
77. F. Titterington, Argillo Works, Rock Island.
78. D. H. Arbogast, Farmer City.
79. N. L. Mamer, Mamer Bros., Campus.
80. John B. Bennett, Urbana.
81. T. T. Johnson, D. F. Johnson & Sons, Pinkstaff.
82. J. W. Arbuckle, Madden & Co., Rushville, Ind.
83. J. W. Hensley, Indianapolis, Ind.
84. B. H. Richards, Edwardsville.
85. A. J. Wheat, Emmetsburg, Ia.
86. E. D. Parsons, Emmetsburg, Ia.
87. G. G. Wheat, Emmetsburg, Ia.
88. R. B. Holmes, v. p. Danville Brick Co., Danville.
89. John E. Shea, secty-tres. Danville Brick Co., Danville.
90. Will P. Blair, Terra Haute Vit. Brick Co., Terra Haute, Ind.
91. M. W. Blair, Atlas Car & Mfg. Co., Chicago.
92. W. S. Purington, Purington Paving Brick Co., Galesburg.
93. F. G. Matteson, Purington Paving Brick Co., Galesburg.
94. J. H. Millsom, Macomb Sewerpipe Co., Macomb.
95. J. W. Robb, Clinton Paving Brick Co., Clinton, Ind.
96. L. E. Rodgers, Chicago.
97. H. J. Mies, Saunemin.
98. James Luther, National Drain Tile Co., Terra Haute, Ind.
99. W. B. Chapman, Morgan Construction Co., New York, N. Y.
100. E. D. Porter, Monmouth Mining & Mfg. Co., Monmouth.
101. A. W. Gates, Monmouth Mining & Mfg. Co., Monmouth.
102. H. E. Search, Dunlap Mfg. Co., Bloomington.
103. H. G. Jerge, New York Blower Co., Chicago.
104. L. H. Lambert, Beaverville.
105. Albert Veiock, Monmouth Mining & Mfg. Co., Monmouth.
106. D. V. Purington, Purington Paving Brick Co., Chicago.
107. F. D. Oakley, National Drain Tile Co., Terre Haute, Ind.
108. J. L. Scott, Macomb Sewerpipe Co., Macomb.
109. W. T. Boyd, Acme Brick Co., Cayuga, Ind.
110. Robert Unzicker, Peru.
111. F. L. Selley, Selley & Son, Danville.
112. Martin W. Lauer, American Clay Product Co., Chicago.
113. C. W. Raymond, Jr., C. W. Raymond Co., Dayton, O.
114. W. J. Lee, Sheldon Brick Co., Champaign.
115. Edward Lee, Sheldon Brick Co., Champaign.
116. Geo. W. Smith, Urbana.
117. John Smith, Urbana.
118. Frank Fellers, Ridge Farm.
119. Arthur N. Allen, Chicago.
120. H. C. Walker, Chicago.
121. H. C. Adams, pres. Danville Brick Co., Danville.
122. A. R. Ponder, Cape Girardeau Pressed Brick Co., Cape Girardeau, Mo.
123. S. M. Coe, Wingate Concrete Machine Co., Columbus, O.
124. W. F. Lodge, Monticello.
125. James L. Daugherty, Streator Clay Mfg. Co., Streator.
126. LaCledre Fire Brick Co., St. Louis, Mo.
127. Ohio Ceramic Eng. Co., Cleveland, O.
128. Evans & Howard Fire Brick Co., St. Louis, Mo.
129. Frost Mfg. Co., Galesburg.
130. Main Belting Co., Chicago.
131. Banner Clay Works, Edwardsville.
132. Christy Fire Clay Co., St. Louis, Mo.
133. S. H. Alsip, Standard Brick Co., Belleville.
134. Chicago Brick Mch Co., Chicago.
135. Arthur Koppel, Chicago.
136. Gem City Paving Brick Co., Quincy.
137. Samuel Anderson, Taylorville.
138. S. M. Cowgill, National Drain Tile Co., Terra Haute, Ind.
139. C. & A. Potts & Co., Indianapolis, Ind.
140. Terra Haute Pressed Brick Co., Terra Haute, Ind.
141. Pettyjohn Bros. Co., Terra Haute, Ind.
142. A. Conner, Montezuma, Ind.
143. C. D. Cowgill, Brockton.
144. Albion Vit. Brick Co., Albion.
145. Scott Mfg. Co., St. Louis, Mo.
146. Fred May, Lafayette, Ind.
147. Oliver Tilbury, Towanda.
148. P. H. Tiernan, Macomb.
149. W. T. Blackburn, Paris.
150. W. R. Guyer, Abingdon.
151. C. A. Harbaugh, Mendota.
152. J. J. Carpenter, Altamont.
153. Geo. H. Willems, Roanoke.
154. F. E. Swift, Ottawa.
155. T. J. Carpenter, Altamont.
156. S. C. Cowgill, Montezuma, Ind.
157. J. L. Turnbo, Metropolis.
158. A. Towle, Peoria.
159. Thomas Moulding Co., Chicago.
160. Oscar Frazee, Moweaqua.
161. Southern Fire Brick & Clay Co., Hillsdale, Ind.
162. S. S. Curry, Danville.
163. John Gretencort, Montezuma, Ind.
164. H. H. Prather, Covington, Ind.
165. Henry M. Nichol, Chicago.
166. F. A. Martin, Mazon.
167. L. R. Whitney, Terra Haute, Ind.
168. J. W. Wild, Gilman.
169. A. S. Currie, Reddick.
170. A. W. Thatcher, Ivesdale.

171. B. Youngman, Pesotum.
172. J. F. Martin, Arthur.
173. La Salle Pressed Brick Co., La Salle.
174. P. L. Youngren, Milwaukee, Wis.
175. Plainfield Tile Co., Plainfield.
176. A. J. Meidroth, Peoria.
177. Star City Brick Co., Lafayette, Ind.
178. P. M. Johnson, St. Elmo.
179. Marissa Brick Yard, Marissa.
180. Alton Paving, Building & Fire Brick Co., Alton.
181. Gillett Brick & Tile Co., Woodhull.
182. Tiffany Enameled Brick Co., Momence.
183. F. M. Judy, Makinaw.

AN ALDERMAN'S PLAN FOR MAKING BIRMINGHAM MAKE REPAIRS TO ASPHALT WITH BRICK.

The plan of Alderman A. B. Carman for repairing and resurfacing of the asphalt coated streets is meeting with the hearty approval of all classes of taxpayers. Even those who have heretofore been quoted as favoring asphalt declare that Alderman Carman is right in his plan to repair with brick.

George A. Kent believes firmly in Alderman Carman's plan to use brick as a material for patching holes in the asphalt.

Superintendent J. P. E. Clark, who has heretofore been in favor of asphalt, says he has every confidence in Mr. Carman and his colleagues.

Former Mayor Jerome DeWitt, is strongly in favor of Alderman Carman's plans, and joins the vast majority in hoping they can be speedily carried out.

George A. Kent, who has heretofore been quoted in favor of the asphalt propositions, said today:

"I believe that thin brick is the best material for patching the holes in the asphalt pavements that have hitherto proved so expensive. Last year I observed several holes in the asphalt that had been filled with brick and came to the conclusion that it was an experiment worth trying. I conferred with Superintendent of Streets J. V. N. Williams, and he informed the bricks were wearing well and he thought as a paving repair material they were a success.

"A test has been made of 2½ inch brick, and the result appears to be good. Brick has this advantage, that in order to repair a hole it is not necessary to import an expensive plant. A single workman can accomplish the same result. Chenango street last year was in a fearful condition a larger portion of the summer, and it was a wonder the city did not have an action for damages on its hands, for there would have been no question as to liability had anyone been hurt by a wagon slipping into one of the pavement holes.

"I believe the repair of holes in the asphalt pavement with brick, should begin at once."

Former Mayor DeWitt said: "I am strongly in favor of the plans outlined by Alderman A. B. Carman for repairing and resurfacing the asphalt pavements of the city. I believe there should be no more asphalt. No asphalt pave-

ments were laid while I was mayor, the asphalt operations being confined to pavement repairs. Brick has been tried and is wearing well. It has the advantage that a repair plant is not a necessity. I am in favor of brick and of Alderman Carman's plan for obtaining it."

Superintendent J. P. E. Clark of the Binghamton Street Railroad Company, said:

"Personally, I have always favored asphalt pavement, believing that if asphalt of the proper formula and consistency was properly laid that it is the most satisfactory and acceptable pavement, furthermore, the most economical and durable in the long run.

"As far as the question of local repairs is concerned we are at this time confronted by a peculiar situation. I having every confidence in Chairman Carman and his colleagues, therefore state, without having given the proposition any consideration or thought, that any plan they suggest will undoubtedly be, under existing circumstances, the most economical and practicable.

"The Binghamton Railway Company, when necessary to take up and restore pavement for new construction or track repairs, has in most instances, where the city has consented thereto, relaid the pavement with brick, largely for our own convenience, track repairs and maintenance being more easily and economically cared for in brick than in asphalt pavement."

LET THE MAYOR KNOW TO-DAY.

If you are opposed to further waste of money in asphalt, send one of The Binghamton Press coupons to Mayor Woodburn today. If you delay you may be too late to influence whatever action is taken in the matter.

The coupon follows:

CONFIDENTIAL.

Hon. H. H. Woodburn,
Mayor City of Binghamton.

As a taxpayer I desire to place myself on record as being opposed to the continuance in Binghamton of the fallacy of asphalt pavements and asphalt repairs in any and all forms. Asphalt in Binghamton has proved an expensive and unsatisfactory luxury and I respectfully petition Your Honor to exercise your good offices to the end that the Common Council will put an early stop to its useless continuance in this city.

Respectfully,

(Signature here.)

I am in favor of brick as a substitute.

SOLD THE BONDS FOR A WORKING CAPITAL.

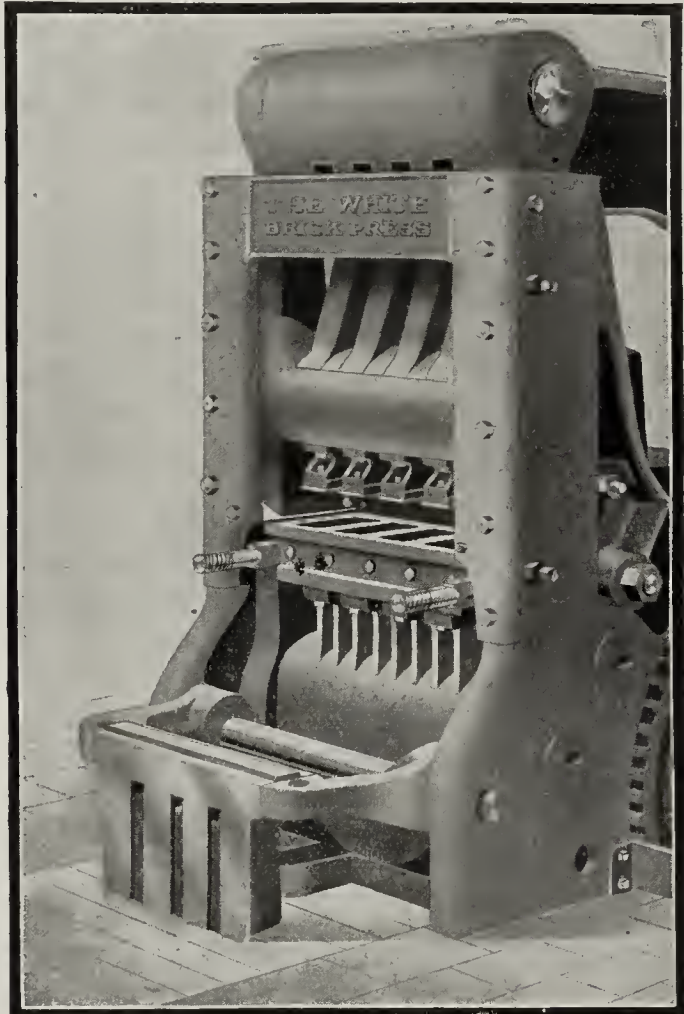
W. D. Henry, president of the National Fire-Proofing Company has admitted that the company has as good as sold \$2,000,000 5 per cent bonds of the Federal Clay Manufacturing Company, an underlying property, which would provide the increased working capital required by National Fire-Proofing. The annual meeting has been postponed until April 5. The total authorized issue of bonds is \$2,500,000, but only \$2,000,000 will be sold at this time, the remaining \$500,000 being kept in the treasury for future needs. The price of the bonds is said to have been around 92½ per cent.

THE NEW WHITE BRICK PRESS.

The art of brickmaking is a progressive one, and within a few years a demand has been made for a press to work materials that would have been considered impossible from a builder's standpoint a few years ago. Sand is very hard on machinery, and the most refractory material made into brick. The extreme pressure required and the sharpness of the sand grains make the problem of wear on any machine a serious one.

These conditions make a clay brick press quite inadequate for sand lime brick making. It was very quickly demonstrated that such a mixture would soon ruin the most successful clay brick press in a very short time and only by

product. The liners should be of hard steel and simple, so that they may be easily duplicated. They should be thin and cheap, as this is the principal item of expense in keeping up a machine. They should be so they could be easily changed, stopping the press as little as possible.



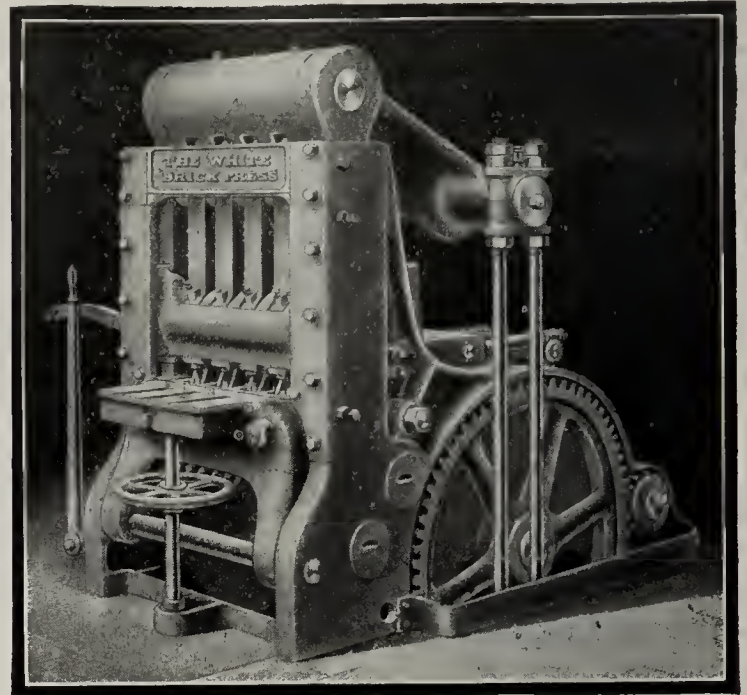
Mold Table Open for Receiving Mold Box.

making the parts much heavier and using steel instead of iron for a portion of the machine and making a number of alterations has any of the clay brick presses been able to make sand lime brick.

The White brick press is the invention of B. C. White, who is well known in the trade as a designer of brick presses. Some of the most successful clay brick presses in this country today have been built from his designs and proportions.

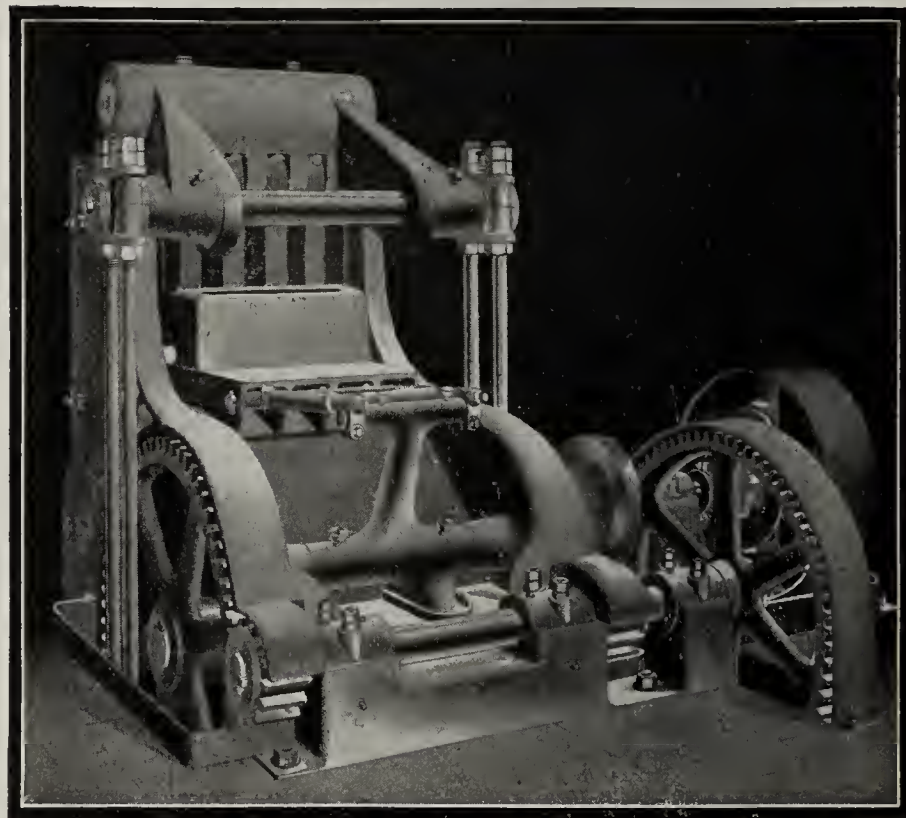
In the White press will be found many new features, the hinged table, the removable mold box, protection for the running parts from grit, the housing in of all gears, the automatic lubrication of all journals, and the steam heating of the mold table, charger and plunger plate are all new.

An important part of a brick press is its molds. Their accuracy, rigidity and finish determine the quality of the



Front View of White Press.

The mold table of the White press is in two parts, the rear part being bolted to the frames while the front part is hinged upon a steel shaft, so that by removing two nuts it can be swung forward to release the molds, and new ones placed in.



Rear View of White Press.

The method of running the mold in the White press is a new and unique feature, instead of stopping the press and

assembling them in the machines an additional box is furnished with each machine, and this work is done at the vise-bench without interfering with the operating of the press until the molds are to be changed. Then the mold box or frame can be slid out and the newly fitted box put in place, the change taking not over thirty minutes to the most.

The White brick press has been put on the market by the American Sand-Lime Brick Company, 77 Jackson Boulevard, Chicago. If you are interested in making sand-lime brick or clay brick by the dry press process you can get further information that will enlighten you on the subject by simply addressing the above firm.



John J. Moroney, Manager American Sand-Lime Brick Co.,
Chicago, Ill.

SOUTH AFRICAN BRICKMAKING INDUSTRY.

The enormous developments that are now taking place in the building trade, especially in Johannesburg, have naturally given a great impetus to the brickmaking industry, and the chairman of the Brick and Potteries company informed his shareholders at the recent meeting that the machinery had been kept going as hard as possible in supplying the demand for their products. By the enterprise of this and other companies the price of bricks has been brought down from £5 to 57s 6d per 1,000, and this reduction should assist in reducing the cost of building and thus tend to lower house rents. The company's operations are on an extensive scale, for besides their building trade output, they supply many of the leading mines with bricks for compounds, etc. During the past year they have supplied immense quanti-

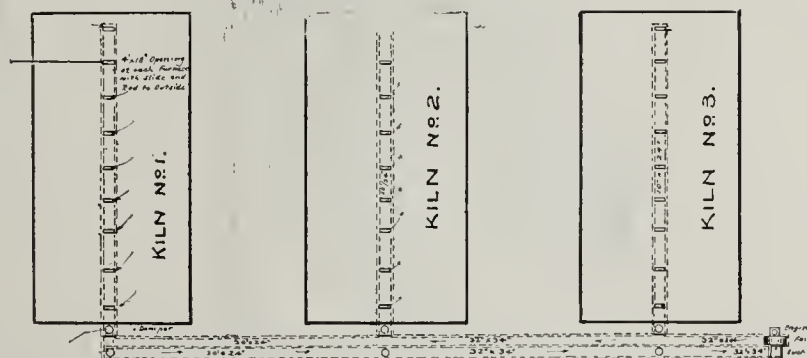
ties of draught kiln bricks to the Central South African Railways for bridges and culverts on the Klerksdorp-Vierfontein and Klerksdorp Fourteen Streams lines. They have just completed a contract for special bricks for covering cable troughs, and also, during the year, furnished the Johannesburg Town Council with a quantity of their products. Business has so enormously increased that extra accommodation is necessary, and the directors have decided to put up new quarters for their staff, to partly rebuild and enlarge the offices, and to turn the old quarters into additional store-rooms. To meet the increasing demand for an excellent blue brick suitable for foundations, engineering and railway bridge work, it has been decided to erect, at a cost of some £3,000, three additional downdraught kilns having a capacity of 200,000 bricks a month.

WASTE HEAT DRYER FROM UP-DRAFT KILNS.

The cut below shows one of the many layouts of waste heat dryers, as installed by the New York Blower Company, 25th place and Stewart avenue, Chicago, Ill. This plan was made for a water smoking outfit of a small dry press brick plant. There were three square up-draft permanent kilns. An underground brick duct was built in the center of each kiln. An opening was provided opposite each furnace, with damper, which latter could be operated from outside by an iron handle. A double underground duct was run along one end of the kilns; the one nearest the kilns was connected with the discharge of the fan and used for blast duct. The other duct was connected with the fan inlet and was used for the section duct.

The blast duct was connected to crossducts under kilns by the usual sliding sheet iron dampers, while the suction duct was connected through manholes and a movable cross-over pipe.

The heat from any cooling kiln can be blown, by this arrangement, to any of the other two kilns.



The cut shows No. 1 kiln cooling and the heat is blown to No. 2 kiln. A specially built 90 inch, $\frac{3}{4}$ housing bottom horizontal fan was used with a direct connected vertical engine, with water jacketed bearing.

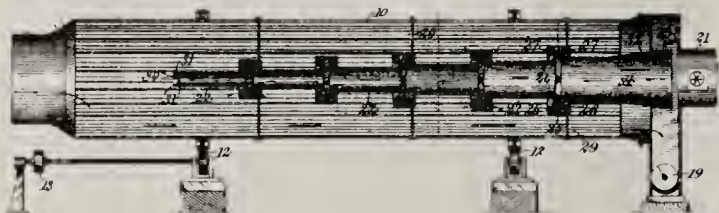
The outfit has proved itself highly successful and paid for itself the first season. Of course, every brick plant has to be treated differently, and any parties either wishing to install a new dryer, or to remodel their old one, will do well to take the matter up with the New York Blower people, and let them make an estimate and plan. They will do this without cost to prospective customers.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

807,997. Drier. John W. Biles, Louisville, Ky. Filed March 1, 1905. Serial No. 247,846.

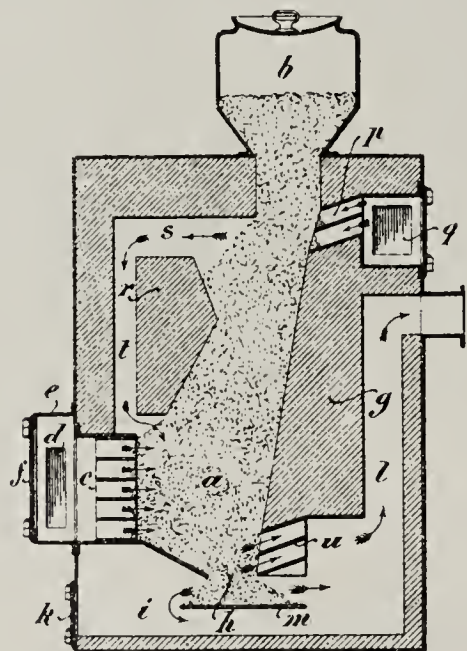
Claim—The combination with a drying-chamber, of a heating-conduit extending into the chamber and comprising sections between which are spaces, and deflectors extending outside the sections and opening at each side of the spaces.



The combination with a drying-chamber, of a heating-conduit extending into the chamber and comprising sections having at their adjacent ends outward projections, spacing members introduced between the projections, and deflecting rings supported upon the projections.

808,244. Gas-Producer. Ernst Korting, Hanover, Germany. Filed March 21, 1903. Serial No. 148,826.

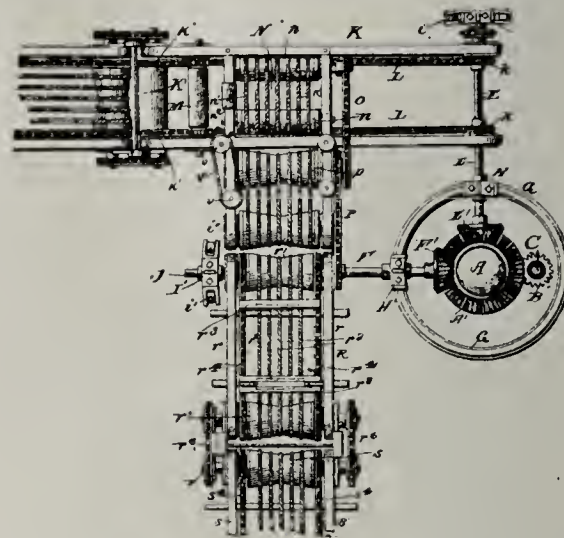
Claim—In a gas-producer the combination, with the producing-chamber, of the vertical grate in the front wall thereof and the opening for admitting air to the grate, a gas-outlet located entirely below the horizontal middle plane of the grate, and a supply-shaft constructed as an upward extension of the producing-chamber and closed to prevent the entrance of air to the top of the bed of fuel, substantially as and for the purpose stated.



In a gas-producer the combination, with the producing-chamber, the vertical grate in the front wall thereof, the opening for admitting air to the grate, the gas-outlet located below the middle plane of the front grate, and the supply-shaft constructed as an upward extension of the producing-chamber, of an auxiliary vertical grate located in the rear wall of the producer a distance above the front grate, an opening for admitting air to the auxiliary grate, an upper open gas-chamber located within the producer opposite the auxiliary grate, and a channel extending from said gas-chamber along the inner side of the front wall of the producer to a point above the front grate, substantially as and for the purpose stated.

807,916. Elevator and Conveyer. August G. Edmund, Vicksburg, Miss. Filed March 28, 1905. Serial No. 252,491.

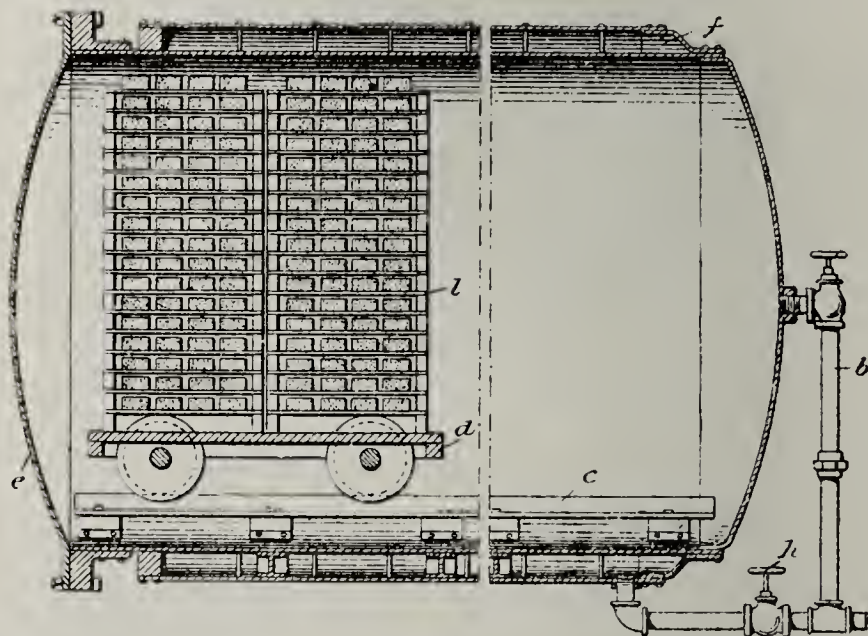
Claim—The combination of a motor, horizontal rotary shafts geared therewith and extending at right angles therefrom, conveyers connected with and operated by said shafts, and extending in different directions, the conveyers being formed of a series of sections which are flexibly connected



and each section comprising a frame having parallel side bars, and means arranged within the same for carrying and conveying freight, the several sections being provided with means for operatively connecting the movable carriers of said sections, substantially as described.

809,053. Manufacture of Sand-Lime Bricks. Alexander Gordon, Weiser, Idaho. Filed May 4, 1905. Serial No. 258,808.

Claim—A process of making sand-lime bricks, which comprises molding by the wet process, subjecting the bricks thus produced to dry heat in a closed receptacle, and then subjecting them to a moist heat.

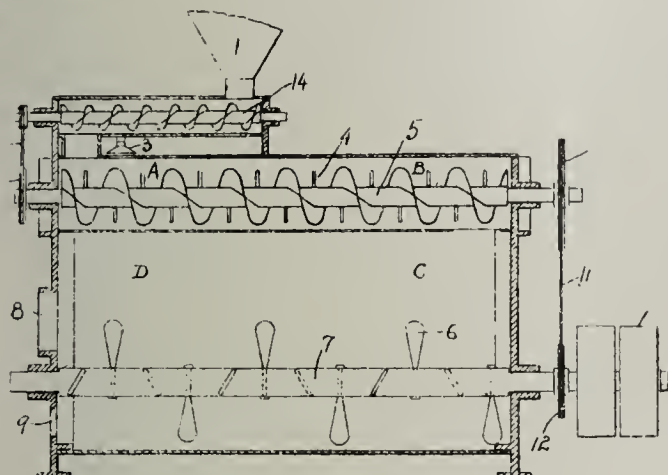


An apparatus for hardening sand-lime bricks, comprising a receptacle having a steam-jacket and provided with a track upon the inside thereof, a pipe for introducing steam into the jacket, a pipe for introducing steam in the interior of the receptacle, valves for both of said pipes, and means for connecting said pipes with the main supply-pipe, in combination with a truck for running on said track, said truck being provided with pallets for supporting sand-lime bricks in a soft state.

807,600. Process for Hydrating Lime. Carleton Ellis, Boston, Mass. Filed Dec. 26, 1903. Serial No. 186,671.

Claim—Process for the continuous production of dry,

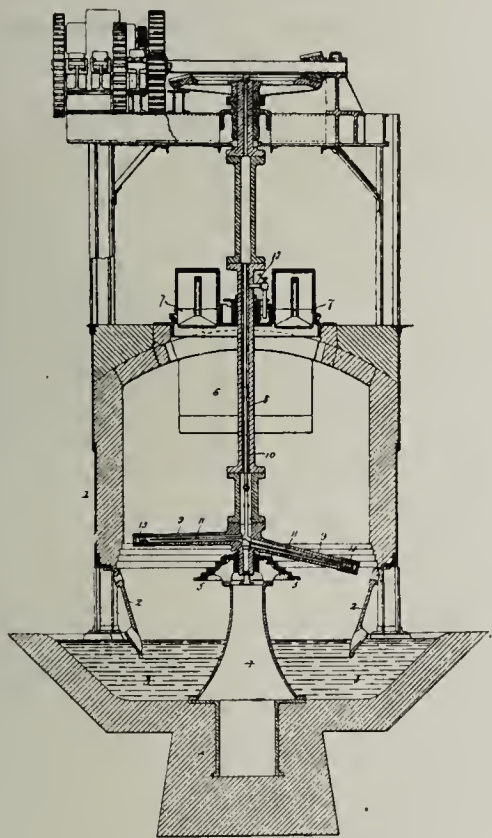
pulverulent hydrate of lime which consists in continuously mingling a stream of quicklime with a stream of water in suitable proportions and in subjecting the resulting stream of lime putty to continuous agitation and to the reaction-accelerating action of heat from a progressively-advancing,



adjacent, heat-imparting mass of lime in an advanced state of hydration, until the absorption of water has largely taken place, then causing the progressing stream in turn to become the heat-imparting agent and simultaneously rapidly agitating the same until converted into dry hydrate of lime.

809,023. Gas-Producer. Orville C. Skinner and James E. Sheaffer, Burnham, Pa. Filed July 27, 1904. Serial No. 218,352.

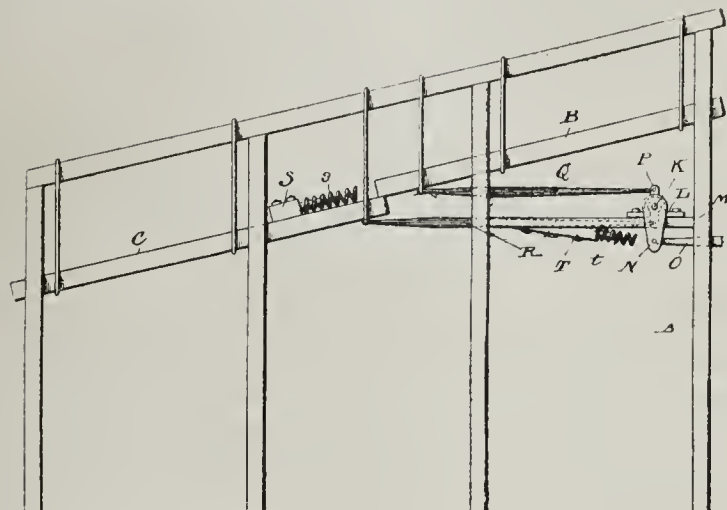
Claim—The combination in a gas-producer, of a stirring-arm mounted within the producer, the arm having a nozzle through which water is projected into the mass of fuel at the point where clinker usually forms, substantially as described.



The combination of a gas-producer having a rotation shaft with a hollow arm projecting into the mass of fuel in the producer, and means for discharging a jet or stream of water from the outer ends of said arm against the walls of the producer, substantially as described.

807,475. Operating Mechanism for Screens. John E. LeBosquet, South McAlister, and Thomas Bell, Hughes, Indian Territory. Filed Feb. 10, 1905. Serial No. 245,127.

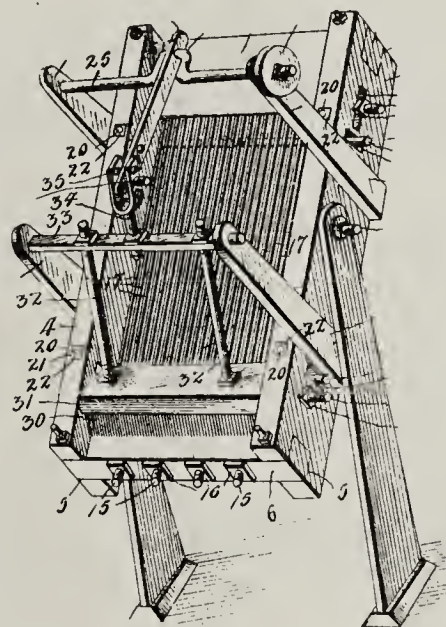
Claim—In combination with a frame and two shaking screens mounted therein, springs secured to one screen and so positioned as to be struck by the other screen, a shaft suitably journaled on the frame, double-ended cranks se-



cured to said shaft, rods connecting one end of said cranks with one screen, rods connecting the other end of said cranks, with other screen, a crank secured to the end of said shaft, means to oscillate said crank, and a spring-buffer mounted on the frame to engage the crank at the extremity of its stroke, substantially as shown and described.

808,590. Clay-Screen. Neal Allen, Pittsburg, Kans. Filed April 20, 1905. Serial No. 256,583.

Claim—The herein-described screen comprising a frame having side bars and cross-bars, said side bars being provided with transverse slots, rods extending from side to side of the frame and having their ends disposed in said



slots, adjusting-bolts in the side bars of the frame to adjust said rods in said slots transversely with respect to the side bars, longitudinally-movable adjusting-bolts in the cross-bars of the frame, rods carried by the last-mentioned justing-bolts, and screen-wires attached to said rods and bearing on the transverse adjustable rods, substantially as described.

ADDING MANY NEW SALESMAN.

The Montello Brick Company, Reading, Pa., has been forced by increased business to add eight men to the staff of General Sales Manager W. O. Stieff. The business of the company has expanded to enormous proportions during the past few months.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII. FEBRUARY 15, 1906. No. 3

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

CONVENTIONS.

The sixth annual meeting of the Wisconsin Clay Workers' Association will be held at Menominee, March 9, and 10, 1906.

If a man's heart is all right, his head is not far out of line.

People who live in glass houses should be grateful to the inventor of curtains.

The badness in the best of us and the goodness in the most of us should restrain any of us from throwing mud at the rest of us.

The Clay Record, the only semi-monthly Clay Journal in America. The largest circulation in the field without a doubt. If you are not now an advertiser, get into our wagon. Subscriptions are only one dollar per year.

One of the most edifying papers, neither unlooked for nor surprising to any one knowing the gentleman, was that of Prof. Ross C. Purdy on "Observations and Notes Gleaned from Visits Among the Clay Workers of Illinois." And the theme chosen was most happy and timely. Ordinarily the professors emerge from their chambers with pa-

pers evolved therein always upon themes as "dry-as-dust," very scientific yet ever far above the comprehension of the average hearer. But not so in this instance. The professor had gone up and down and across the state, and bringing his trained powers of observation and quick wit to bear on what he saw and heard evolved this paper giving us something positively inspiring and refreshing as it could possibly be, producing that keen satisfaction always experienced upon listening to a talk telling us what the other fellow said.

We are sure our readers will be delighted to hear of the cordiality of the clay workers of Illinois toward the ceramic department of the University and the State Geological Survey; that they are as of one mind in their support and encouragement of these two institutions.

We were not surprised there should be found a few who failed to see the benefits that would result to them if they were to become members of the Illinois Clay Workers' Association, because we were aware there were a few such, but it is to be hoped the "heart to heart" talk of the professor with these gentlemen will result finally in their coming into the fold. They will be welcomed, and once within the fold will become the most valuable among the membership, for it is a matter of common observation that as a rule those who are slowest to appreciate the virtues of a good thing, are invariably the most enthusiastic over the acquired blessing and are indefatigable in their efforts to spread it.

Every man interested in the clay working industry will heartily approve of the professor's insistence on the necessity for the cultivation of the technical or scientific along with the mechanical phases of ceramic education giving to each equal consideration. The men in the future who will manage the small as well as the big plant will be successful in that degree and to that extent their qualifications based on their scientific and practical knowledge will permit or enable them to be.

For some time the Clay Record has taken a deep interest in the subject of economy in steam power in connection with brick-making plants, believing it a subject that had not received the attention and consideration it deserved, and now cannot refrain from congratulating the members of the Illinois Association on being privileged to hear the able paper on this subject prepared by Mr. W. W. Ittner and read to them at the recent convention, at the same time complimenting Mr. Ittner on the comprehensive character of his paper. The interesting discussion which followed was not among the least of the tributes it received and deserved.

It should not be expected of any man, however expert he may be, to give off-hand the particular power plant that

will be the most economical in any and every situation presented to him.

When his opinion is asked he has the right to demand that he be made acquainted with all the conditions and circumstances affecting and surrounding the plant; that he may study these profoundly and no less comprehensively than is studied the marl and clay to determine the quality of material they will make, the type of machinery best adapted to work up the material, etc.

Conceding and granting these points, which we believe were assumed in the discussions, we are delighted to say that the point of the paper was that any and every plant, whether small or large, should receive the highest possible consideration with the one and sole object of installing the peculiar and particular plant which in its location shall be the most economical in operation. Or in other words, that the power-making end be placed on a parity with every other end of a brick-making plant.

A paper on "Sewer Pipe; Its Properties and Requirements" by Prof. Arthur N. Talbot and Roy H. Slocum, University of Illinois, was highly interesting and instructive, replete with technical information and detail, and it will be recognized as an authority on the subject in the future.

Sanitation, the science of sanitary conditions, is an exceedingly live subject and commanding the best thought and skill obtainable acquainted with what is known in its lines; furthermore, it is a subject in which the people are taking a lively interest and demanding the very best obtainable in means and methods, particularly as to carrying away the sewage of houses, streets, etc., and this means sewer pipe, whether of vitrified clay or cast iron, is no matter to them, whichever will effectually carry away the refuse material, foul gases, etc., to a distant point is what is demanded. Now, as we are all interested in the development and growth of the vitrified clay sewer pipe industry, we are more than anxious that those engaged in this industry shall be fully awake and alive to the possibilities in its manufacture, its properties and requirements; that they appropriate every scientific discovery and with the results of practical experience combining them apply them so that the virtues of clay sewer pipe be fully recognized everywhere and adopted, thus contributing to the material growth of the business, and at the same time doing a work for humanity in providing a sure means for the preservation of health.

We are confident that results will follow this discussion beyond present anticipation, as it seemed to us the happiest blending of the scientific and practical; besides, it was replete with suggestions along collateral lines, and sure to deepen interest in innumerable directions.

TWO DIVIDENDS OF 100 PER CENT.

A few weeks ago the Rose Brick Company of Roseton declared a dividend of 100 per cent. It was stated at the time that this did not represent the full profits of the season, which will not end until the river closes or all brick is disposed of. On Thursday another meeting of the company was held, and a second dividend of 100 per cent declared. There are still lots of brick on hand.

COMBINE TO BUY AKRON BRICK PLANT AND WILL FIGHT TRUST.

It was stated that a company recently formed by a number of building contractors in Cleveland, Ohio, was endeavoring to purchase one of the largest brick plants in Akron for the purpose of manufacturing their own brick and that it would buck the alleged brick trust in this city and Cleveland.

It was announced that the Cleveland company would take an option on the plant at once.

ACCIDENTS, DAMAGES AND LOSSES.

Creditors of the Wooster (O.) Shale Brick Co. have filed a suit in bankruptcy against the company.

Ben Kostenlick, a workman in the Royal Clay Works, Canal Dover, O., was caught in the shafting and torn to pieces and instantly killed.

The Home Brick Co., Iola, Kansas, has been sold at receiver's sale to T. J. Fulton, G. A. Bowlus and H. H. Funk for \$5,000. The plant cost \$30,000.

H. B. Lohoke, employed at the National Brick Co.'s plant, at Chicago Heights, Ill., was struck by a piece of tile falling off a roof and his skull fractured.

The foreclosure proceedings against the Port Credit, Ont., Brick Co., have been completed and the defendants prohibited from further occupation of the property.

John Wagner was badly hurt at the Shull & Badger Brick Yard at Butler, Pa., by a large lump of clay falling upon him. He was taken to the hospital, where he died of internal injuries.

Wm. Miller, an employe of the Harbison-Walker Brick Works, at Mt. Union, Pa., who was just convalescing from a severe attack of typhoid, drank carbolic acid and died a few minutes after.

Creditors of E. Lanzzone, brick manufacturer at Stockton, N. Y., filed a petition to have him declared a bankrupt. In October he transferred a part of his property to the United Co-Operative Brick Co.

The brick companies of Haverstraw, N. Y., have retained Charles Morscheuser of Poughkeepsie to defend them against damage suits threatened to arise from the recent landslide by which several persons were killed.

Henry A. Nobbs, treasurer of the Federal Clay Mfg. Co., and the American Vitrified Conduit Co., and cashier of the National Fire Proofing Co., New York office, 170 Broadway, shot and killed himself in a hotel at Paterson, N. J. He lived with his wife and six children at Hackensack, N. J.

KEEP YOUR "EYE" ON YORK, PA.

York, Pa., used 75 per cent of light color bricks in her building operations during the year 1905. She has five soft mud plants producing common brick, and four "dry" Press plants, with a capacity of 20,000 each, producing a cherry red brick from a green shale which is very abundant in that locality.

In Room 61, Continental Hotel, at the recent convention held in Philadelphia, were shown light grey, buff and red clays; shales of red, green and blue found on a tract of land owned by P. B. Spahr of York. Finished product made from the various materials, color press brick from cream white to rich dark olive, encaustic, floor, dutch and roofing tiles, all burned in "down draft" kilns and steel hard.

It was only for the modesty of Mr. Spahr, that this interesting exhibit was not located with the regular exhibits. Many of the delegates, who were interested in the manufacture of light color brick visited room 61, all expressing themselves as of the opinion, that the proposition and exhibit were "brick right" and that Mr. Spahr was "all right."

We predict at an early date an up-to-date plant will be located to develop this tract, and manufacture a line of clay products that will have a market from Maine to Texas.

FISKE & COMPANY INSTALLING NEW MACHINERY.

Fiske & Company, Inc., of Boston, are now installing at their plant at Dover Point, N. H., a complete set of new brick machinery manufactured by Chambers Bros. Company, of Philadelphia. This machinery is the largest and strongest which has ever been turned out at the Chambers' shops, and when installed will insure a production of from 60,000 to 80,000 side cut brick per day, or a yearly production of at least 15,000,000 brick. The product will be common, face and sewer brick. A new engine of increased power is also being installed and extensive changes in the kilns are being made. The electric traveling crane with the brick handling device, as patented by J. Parker B. Fiske, will be used without any change, as several years' experience has proved that it is a thoroughly practical and efficient apparatus for the elimination of hand labor in brick making.

TAKEN FROM THE SHAWNEE JOURNAL, FEBRUARY 15, 1906.

A very valuable vein of clay was found on the ground of the Shawnee Flash Brick Co., while excavating for the press room. The vein is said to be about 20 ft. in thickness, and is considered by experts to be of the very best, and that which has been already moved is saved for the purpose of manufacturing bricks in the near future. Samples have already been made and burned of this clay and have proved all right. The company is to be congratulated on the discovery of this clay, heretofore unknown in the Shawnee district, and will enable them to put out several new kinds of brick.

ILLINOIS BRICK COMPANY ANNUAL REPORT ISSUED.

According to the annual report of the Illinois Brick company issued Feb. 5th, net earnings for the last seven months of 1905 were at the rate of 16 per cent on the company's stock. The balance sheet issued showed a surplus for the seven months noted of \$256,857. Within the period 3 per cent was paid in dividends, making 9.4 per cent for seven months, or at the rate of 16 per cent for twelve months.

In his annual report President Prussing recounted the reduction in the capital stock of the company last May when it was reduced to \$4,000,000, a sum which he says "fairly represents its assets upon which, barring extraordinary accidents, regular dividends can be earned and paid." He continues:

"By the reduced capitalization the surplus shown in the last annual statement (being the sum of \$569,442) was wiped out, so that the surplus reported today has been accumulated since June 1, during the last seven months of 1905.

"While our plants are kept in a state of efficiency by making timely repairs, the cost of which is charged to brick making direct, this company has expended during the year, for construction, permanent betterment of yards, the sum of \$175,930.

"Our real estate holdings are larger and our plants are of greater value and efficiency than ever before.

"The prospect for the future is good. Chicago will continue to build and require more brick from year to year, and this company is now in a position to meet any and all competition."

The balance sheet as of Dec. 31, 1905, follows:

ASSETS.

Real estate	\$1,078,209.
Buildings and machinery	2,557,307
Accounts receivable	368,531
Brick	294,984
Supplies	82,829
Bills receivable	2,246
Cash	46,788
Total	\$4,430,896.

LIABILITIES.

Capital stock	\$4,000,000.
Accounts payable	114,038
Dividend Due Jan. 15, 1906.....	60,000.
Surplus	256,857
Total	\$4,430,896.

Dividends have been paid as follows:

April 15, 2 per cent on 34,217 shares.....	\$ 68,434
July 15, 1½ per cent on 40,000 shares.....	60,000.
Oct. 15, 1½ per cent on 40,000 shares.....	60,000
Jan. 15, 1½ per cent on 40,000 shares.....	60,000.

Total

At the annual meeting yesterday the by-laws were changed and the number of directors reduced from eleven to nine. These were divided into three classes of one, two, and three years. The board was chosen as follows:

For one year, A. J. Weckler, E. C. Potter, S. Warren Lamson; for two years, C. B. Ver Nooy, D. R. Forgan, W. E. Schlake; for three years, George C. Prussing, M. A. Farr, C. D. B. Howell.

Officers were elected as follows: President, George C. Prussing; vice-president, A. J. Weckler; treasurer, C. D. B. Howell; auditor, C. B. Ver Nooy; secretary, W. E. Schlake.

CONTRACT FOR BARBER PLANT GOES TO MITCHELL.

Mr. Paul Beer, superintendent of the Barber Paving Company's brick department, Des Moines, Iowa, has awarded the contract to W. F. Mitchell & Co. for the construction of buildings, kilns, etc., to be utilized in the creation of its new \$150,000 brick plant at South Fourteenth street and the Great Western tracks. Contracts for special machinery were also awarded to an Ohio firm, and the contract for other machinery will go to the Des Moines Manufacturing and Supply Co. The total of the contracts amounts to about \$150,000.

W. F. Mitchell & Co. commenced work on the plant and expect to employ a force of about 100 men until the first of May. The plant will include the following buildings, all of brick, steel and concrete, and of fireproof construction.

Crusher house, 27x70 feet, in which will be installed a crusher and four pan crushers, piano wire sieves, etc.

A machine room, 50x100 feet, in which will be a brick machine with a capacity of 150,000 brick or paving block a day, and four repress machines, besides a cutting table and other machinery. A power house, 30x66 feet, in which will be placed a 330 horsepower engine and four boilers.

A coal storage building with capacity sufficient for the storing of a supply on which the plant can be operated for a month.

A building, 87x100 feet, designed as a waste heat dryer house. This house will be equipped with induction fans that will draw to it the waste heat from the kilns, with which the brick will be dried before being introduced into the kilns, and two exhaust fans to take out of the building the damp air. There will be sixteen round kilns of the down draft style with provisions for the addition of eight more kilns; these to be grouped about a monster smoke stack.

The machinery equipment in addition to the enumeration given above, will include a complete system of conveyors constructed of belts, gravity inclines, elevator cups, etc., so arranged that from the time the clay enters the crusher in the pit it will not be handled again until the brick come out on the cutting tables ready for transmission to the represses.

The plant will be equipped with a complete system of tracks for the handling of brick, clay, etc., without turntables and operating the loads by gravity, while tracks connecting with the several roads of the city will be built by the company at its own expense.

The entire plat of ground to be occupied by the plant will be paved with brick, the paved area to comprise several acres.

In the construction of the plant 3,000,000 brick, 3,000 barrels of cement and over 1,800 yards of crushed stone will be used.

Mr. Beer states that the plant, next to that of the Metropolitan plant at Canton, Ohio, will be the largest west of Pittsburg. It will make paving brick, vitrified builders, paving block, and highly ornamental face brick.

The plant will be ready for operation about June 1.

Much of the preliminary work, such as grading the site for the buildings, wrecking old buildings and excavating for foundation walls, etc., has been completed.

OPTIONS OBTAINED BY NEWTON JACKSON IN OHIO HAVE EXPIRED.

Practically all the options obtained by Newton Jackson of Philadelphia on potteries in the Ohio district have expired, and this is taken to mean that no combination of potteries will be formed.

This is the fourth unsuccessful attempt to complete a pottery combination. John R. Dos Passos of New York first took up the proposition, and was followed by James R. Davis of New York. East Liverpool capitalists took up the proposition for the third time, and Jackson's was the fourth attempt.

A NEW TILE FACTORY FOR IOWA.

The stockholders of the Northwestern Tile and Clay Products Company, Emmetsburg held a meeting Monday and elected the directors of the company. They are as follows:

E. B. Soper, H. C. Shadbolt, James Dunigan, G. G. Wheat and E. B. Persons.

The officers are: G. G. Wheat, President; H. C. Shadbolt, Vice-President; E. B. Persons, Secretary; E. B. Soper, Treasurer.

The directors met later in the morning and transacted much business of importance to the company and laid the necessary plans for getting to work on the various things necessary to the operations of the company. The grounds are to be secured and the machinery purchased and the buildings erected. It will take time for all of these things, but the matter will be pushed to secure an early operation of the factory.

SENSATIONAL ALLEGATIONS MADE AGAINST A CLAY WORKS.

On the allegation that it had been fraudulently beaten out of tariffs by the defendant, the Great Western railroad company has brought suit against the Lehigh Clay Works, Ft. Dodge, Ia., for the recovery of \$762.63, the amount alleged to have been withheld.

According to the allegations of the plaintiff, the defendants fraudulently misrepresented the weight of shipments for a considerable length of time, and the amount of money asked for in the present petition, which was filed in the district court, is the additional freight charges alleged to be due the railway company on these misrepresentations of weights. The case is rather a sensational one, and has no precedent in the court.

BANKER WANTS A TILE FACTORY.

Banker H. L. Emmert of Sibley, Iowa, is desirous of starting a tile factory there in the spring, and has offered \$100 to any man who will find and prove to his satisfaction within sixty days the existence of a three-foot layer of first-class tile clay within three miles of town that can be procured on practical terms. It is stipulated that said layer shall extend over an area of not less than three acres in extent and the top of layer shall be within four feet of the surface. It is hoped that some one may be able to win the money offered.

SAND OR LIME BRICK OR BLOCK NEWS.

J. S. Emmerton, Bloomer, Wis., has bought a cement brick machine and will engage in their manufacture.

Reynolds & Klug, Norfolk, Nebr., have bought a cement brick outfit and will put it into operation soon as possible.

It is now assured that sand-lime brick can be enameled or glazed the same as clay brick; several ceramists are now doing so.

A company has been organized of local business men to make sand-lime brick at Oklahoma City, Okla., \$25,000 will be invested in the enterprise.

The Warsaw (O.) Sand-Lime Brick Co. has been incorporated with \$50,000 capital stock by P. M. Moore, S. J. Wagner, J. H. Edeler and J. L. Beck.

O. L. Lamson, Hollister, Cali., has secured the rights to make hydraulic cement brick under the Ferguson patents and it is expected a plant will be built at once.

Arrangements have been made by local people to build a cement brick plant on the John A. Cranston Co. land at Wilmington, Del. The plant will be in operation April 1st.

The Granite Brick Co., Columbus, O., have their plant on Dublin Ave., and are now making sand-lime brick at the rate of 20,000 daily. C. A. Rausch of Plain City, O., is manager.

G. L. Rolfe, J. B. Schrock, W. M. Hunter, P. Shellenberger, F. H. Hilliker and W. J. Walker have formed a company with a three-machine outfit for making cement brick, at Spokane Wash.

The Menominee (Mich.) Brick Co. has turned out its first consignment of colored brick. The company intends to produce black, brown, buff, yellow, purple, pink, red and other colored brick.

The Pensacola (Fla.) Co. is soon to resume operations after more than a year of idleness caused by lack of harmony. J. S. Walton, who superintended the erection of the plant, will have sole charge.

The manufacture of cement brick is now in progress at the hospital at Wauwatosa, Wis., just outside of Milwaukee; 2,000 are being made per day by the patients, and they will be used in making improvements in the spring.

The Semisteel Company, 701 New England Bldg., Cleveland, Ohio, owners of the Ohlmacher system of making sand lime brick, engineers and builders of all kinds of sand lime brick equipments, are continually rushed with orders.

The Milwaukee (Wis.) Steel Brick Co., a new company just formed by J. H. Radke, Alan Place and L. A. Thompson, will make brick from the slag from the Thomas Furnace Co.'s plant in South Milwaukee, at the rate of 40,000 daily.

D. L. Stiven of Grand Rapids, Mich., is organizing a "profit-sharing plan" to make cement and sand lime brick, making cement brick in the summer and sand-lime brick in winter. He expects the employees to take 45 per cent of the stock.

The Iowa Enamel Stone Co., Des Moines, Ia., has been incorporated with \$40,000 capital stock. The principal stockholders are: O. Ruffcorn, Frank H. Stehm, M. L. Dudley, Walter McCain and C. C. Pagh, all of Des Moines, and E. J. Smith of Toledo.

MISCELLANEOUS ITEMS.

Plans are now being considered for a \$12,000 brick plant for Fort Pierre, S. Dak.

The Lake & Cotrill Brick & Tile Co., Shenandoah, Ia., has been incorporated with \$16,000 capital stock by D. S. Lake and others.

Capitalists from Cleveland and Cincinnati are expected to build a large ornamental brick plant on the knobs at New Albany, Ind.

The Garfield (O.) Brick Works have decided in addition to making brick to install machinery for making drain tile, hollow blocks and clay conduits.

P. J. Hungerford, U. G. Cover, U. McBride and S. A. Cover have purchased a site at Keswick, Ia., and a brick and tile factory will be erected.

W. C. Mitchell, formerly of the Banner Clay Works, Edwardsville, Ill., writes from Matanzas, Cuba, that he finds the country desirable in every way.

The Ohio Valley Clay Co., Steubenville, O., has been incorporated with \$200,000 capital stock by J. W. Gill, B. L. Brownlee, G. W. McCord and S. Gill.

W. A. Byron, of the Carbon (Pa.) Brick Co. has closed a deal for the property of the defunct Riverside Brick Co. at Rush Run, O., and will build a \$100,000 plant.

The O'Mara Bros. Brick Co., Terre Haute, Ind., has been incorporated with \$10,000 capital stock by John F. O'Mara, Daniel T. O'Mara and Andrew M. O'Mara.

The Waverly Brick & Tile Co., Kansas City, Mo., has been incorporated with \$20,000 capital stock. Incorporators: Geo. H. Monohan, J. R. Trustin and W. H. Crews.

T. C. Landy and H. S. Mizner, who have been operating the brick plant at Lonsdale, Tenn., have transferred their interests to the Lonsdale Fall Brick Co., Knoxville, Tenn.

The California Avenue Brick Co., Alleghany, Pa., has been incorporated with \$10,000 capital stock. Directors are John W. Virtue, Verona; John W. Palmer, Oakmont; W. D. Myers, Verona.

The Obermann Brick & Supply Co., Newark, N. J., has been incorporated with \$25,000 capital stock by Geo. R. Obermann, Glen Ridge, N. J., and Charles F. Mackin, Jr., 16 Walnut St., Newark.

The Columbus (O.) & Hocking Coal & Iron Co. directors have decided to commence the erection of a fire brick plant of huge proportions about the middle of the year. They have been making tests for the last year.

The Home Industry and Factory Club of Ft. Worth, Tex., has succeeded in getting a new brick plant for that city. Twenty acres of clay and shale 14 feet deep has been bought and the machinery contracted for.

The Jenkins Brick Co., with a capital stock of \$75,000 has begun the work of constructing a large brick plant in North Montgomery near Riverside, Ala. The officers are J. W. Jenkins and F. W. Lull of Wetumpka, president and secretary; W. C. Scott, C. A. McLaren and Mrs. Stewart of Montgomery.

The Gold Brick Co., New London, N. C., is in the market for brick machinery.

J. A. Wilson has sold his Sioux Rapids (Ia.) brick and tile works to M. T. Typper of Dows, who has already taken charge of same.

The Keensburg (Tenn.) Brick Co. has been incorporated with \$5,000 capital stock by J. M. Baker, I. M. Lacy, J. B. Chambers, R. A. Range and L. F. Miller.

Eastern capitalists have purchased 320 acres of land west of Darrow, Okla., and will begin breaking ground in the early spring for the erection of a large brick plant.

Dave and James Good have bought the South English (Ia.) Brick & Tile Co. from W. Lawler, Mrs. L. Stoner and C. E. Wales. Consideration, \$6,000. Possession, March 1.

The Waterloo (Ia.) Granite Brick Co. are considering the doubling of the capacity of their send-line brick plant which has been a money maker since its start the first of July last.

The Danville (Ill.) Brick & Tile Co. has changed its name to the Danville Brick Co., and are now installing machinery and improving the plant to the extent of \$35,000.

The Ulster Brick Co., Newburgh, N. Y., has been incorporated with \$50,000 capital stock. Directors are Frederick Wallace, Hiram Merritt and B. J. MacDonald, all of Newburgh.

The Leakesville (Miss.) Brick & Tile Co. has been incorporated with \$5,000 capital stock, by B. P. Harrison, G. G. Faulk, Nat Owen and M. L. Batson. Ben Hoover will be the superintendent.

The Glen View Brick Co., Clarksburg, W. Va., has been incorporated with \$10,000 capital stock by W. A. Wilkinson, John Patton, E. T. Post and J. W. Coffman of Clarksburg and C. C. Coffman of Mannington.

Highland Brick Co., Bladensburg, Md., has been incorporated with \$100,000 capital stock. Incorporators: Thomas H. Riley, Wm. S. Speir, Wm. H. Dyer, Frederick H. Riley and Frank A. Arnold, all of Washington, D. C.

The Robert Dixon Co. has been organized at Portland, Me., with \$150,000 capital stock, to mine clay and manufacture it into "Dixonite." Officers are I. C. Libby, president, and H. L. Greeley, treasurer, both from Portland.

The Henry Martin Brick Machine Mfg. Co. of Lancaster, Pa., are installing the latest improved "Martin" system of handling and drying soft mud brick, of 30,000 daily capacity for the Maumee Brick & Tile Co., Fort Wayne, Ind.

The Humboldt (Neb.) Brick Works have at last been organized with \$50,000 capital. The necessary machinery has been ordered. C. M. Linn is president; A. A. Tanner, vice-president; H. E. Boyd, secretary and C. M. Hummel, treasurer.

The Alliance (O.) Clay Product Co. have elected new directors and appointed a committee to close a deal for a factory site and proceed to build a plant. P. W. Walker is president; John Eyer, vice-president; O. U. Walker, secretary and treasurer, and Ross Rue, superintendent.

John M. Leonard, Perkins, Ga., will start a brick works.

James Hamilton and others are considering the putting in of a tile plant at Carthage, Mo.

Dr. I. C. McCoy and others of Ft. Worth, Texas, will build a brick works near Birdville.

W. H. Judson, Sherman Smith and M. E. A. Allen, will build a brick works at Hockanum, Ct.

The Berlin (Ct.) Brick Co. has sold its property to the Hotchkiss Bros. Co. of Tarrington, consideration \$60,000.

The Mutton Hollow Fire Clay Co., Woodbridge, N. J., has just purchased a 37-acre tract of clay land at Spa Springs.

The Independence (Mo.) Shale Brick Co. is completing a new building and other improvements at its plant. R. B. Trowbridge is the manager.

The Wyoming Mining & Development Co., Evanston, Wyo., has been organized with a \$1,000,000 capital stock to develop coal and clay in that vicinity.

The American Refractories Co., Pittsburg, Pa., has been incorporated with \$150,000 capital stock at Pittsburg, Pa. Incorporators, Daniel Kirk, B. J. Jarrett.

The Johnston Brick Co., Kingston, N. Y., have filed papers with \$10,000 capital stock. Richard J. Johnston is vice-president and R. Grant Johnston, secretary.

The Nahunta Brick & Improvement Co., Fremont, N. C., has been incorporated with \$100,000 capital stock by L. O. Hayes, W. T. Turlington, F. H. Hooks and James R. Aycock.

W. H. Bushell of David City, Nebr., who has been visiting in Europe for the last three months, has returned and is again ready for hard work. He will greatly enlarge his brick plant before the season begins.

A new company has just been organized known as the Kensington (Ct.) Brick Co. It has \$25,000 capital stock. E. S. Bagley, president; John Carbo, vice-president; T. C. Fagan, secretary, and J. McDonnell, treasurer.

The Ross-Keller Triple Pressure Brick Machine Co., of St. Louis, Mo., have just shipped a complete four-mold outfit to the Southern California Brick Co., of Los Angeles, Cal. The company expects to have the plant in operation by April 1.

THE MAMMOTH KAOLIN BEDS

Deposit 15 to 20 feet thick, covering 500 acres and unexcelled for making Tile, Terra Cotta, Porcelain, Builders', Moulders' and Potters' coarse and fine clay products. It will keep 100 factories in operation for two centuries. Excellent sites and natural facilities for manufacturing plants. **Will sell, lease, bond or work on shares.** Reasons.—Owners not practical or clay men. Located near Railroad in Cedar Valley, Utah. Investigation invited. **This clay has won two Worlds' Fair prizes.** One at St. Louis, 1904, and one at Portland, 1905. **It is pure China Clay,** and that of Cornwall, England, is no better. Also a large deposit of Silica Sand, 99 per cent pure. Send for samples. Address,

HOMER J. KENDALL
LEHI, UTAH

CLAY RECORD.

FOR SALE OR LEASE.

A 32-acre farm, 4 miles west of Macomb, Ill., containing 20 acres of a 10-foot vein of fine pottery clay, with a 5x10 foot shaft in good repair. Also a vein of coal 25 to 30 feet below the clay. Land for sale at \$85 per acre, half cash, balance on long time, one to ten years at 5 per cent, or 6 per cent discount for cash on deferred payment. For full particulars call at premises or address

MILTON W. McDONALD,
Lock Box 39, R. R. 5, Colchester, Ill.

FOR SALE.

One complete brick yard plant, consisting of boiler and engine, stiff mud machine, rolls, automatic cut-off, shifting pulleys, belting. Complete equipment for a 25,000 capacity plant. A bargain if sold at once.

WM. W. THIRLBY,
Traverse City, Mich.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

Profitable running brick plant, 25,000 capacity. Ready sale for entire product. Owner has larger interests requiring attention.

TERRA HAUTE PRESSED BRICK CO.
Terra Haute, Ind.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address
T, care Clay Record,
Chicago, Ill.

FOR SALE.

For sale, reasonable, in condition—

One 5x18 foot Horizontal Tubular Boiler.
One No. 20A Penfield Hollow Brick Machine.
One 14 foot Pug Mill.
One Disintegrator,
One 40 foot Clay Conveyor, with 20 foot belt.
Forty Fire-proofing Dies, with two extensions, pulleys, clutches and belting.
Reasons for sale, are making different ware.
R. 611, W. 51st St.,
New York City.

FOR SALE.

One 25-horse power Engine and one Henry Martin steam power Soft Mud Brick Machine. Address
LOUIS SCHMIDT,
Grand Island, Neb.

WANTED.

A second hand No. 6 Brewer Brick and Tile Machine. Address
EDMONDSON & ROGERS,
Kalona, Iowa.

FOR SALE CHEAP.

A good second hand
E. M. Freese & Co.,
Brick and Tile Machine.
Address E. R. K., Care Clay Record, Chicago.

WANTED

Wanted at Once.—A first class experienced brick burner and setter. State age, experience, salary expected and reference.

B. S. ELMES
Fergusson's Wharf, Va.

FOR SALE.

A brick and tile factory, located in Washington Co., Iowa, in a prosperous condition. Would consider an Illinois or Iowa farm.

E. L. TEAL,
Anderson, Ind.

Machinery For Sale.

FOR SALE

Two Wiles Soft Mud Steam Power Brick Machines. Two Tempering Wheels for horses. 40 h.p. Boiler. 30 h.p. Engine. 5 or 6 Trucks. All necessary Belt and Shafting. Also about 500 feet light Steel Rails with Switches. Everything in good working order. Will sell cheap as we have started an in-door yard.
E. T. & IRVING HAND,
Plainfield, N.J.

FOR SALE

One Komnick 1000 to 1200 per hour sand-lime Brick Press in good condition. Was replaced with larger capacity press, same make. Inquire of the
SAGINAW SANDSTONE BRICK CO.
Saginaw, Mich.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.
Both styles of cars in first-class repair.
ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address
"GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.
THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address
ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address
ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new. DEALER,
Care Clay Record, Chicago, Ill.

FOR SALE CHEAP.

One second-hand Chandler & Taylor 80 horse-power Horizontal Tubular Boiler, 60 inch diameter by 6 feet long, with full flush front.
AMERICAN CLAY MACHINERY CO.
Bucyrus, Ohio.

FOR SALE.

One 70 horse power Frost Tubular Boiler, one 45 horse power Frost Slide Valve Engine. In good condition, will sell cheap as we have changed to electric power.
CENTERVILLE BRICK & CONSTRUCTION CO.
Centerville, Iowa

WANTED.

An experienced and competent brickmaker to take charge of soft mud plant near Cincinnati. State experience, references and wages expected.
GENERAL SUPPLY & CONSTRUCTION CO.
24 State St., New York.

BRICK PLANT FOR SALE.

Splendid Chance for Contractor.

One of the finest, most modern brick plants for sale in southern part of Central Illinois. Live growing city, good prices, making money. Dry press, built in 1904. Best of reasons for selling. Price \$25,000, if taken at once. Address
ILLINOIS, care Clay Record.



Paper Joggers quoted.

R. A. HART, 41 White St.

No better made, cut from
\$3 and \$10.10
4 Wheel, \$3.00
5 Wheel, \$3.25
Guaranteed.
Sold by all dealers
BATTLE CREEK, MICH

FOR SALE.

Up-to-date brick plant with Creager machinery, in prosperous city of 15 000 inhabitants, in Southern Illinois. Good residence and farm of 40 acres attached to plant. Splendid opportunity. Only plant in city. Address
H. H., care Clay Record, Chicago.

MACHINERY FOR SALE.

One 4-mold Simpson Dry Press. One Steadman Pulverizer. All size boilers and engines from 30 h.p. up. Send for list.
MERTES MACHINERY CO.
Milwaukee, Wis.

MACHINERY FOR SALE.

One new steam iron Quaker soft-mud brick machine, bought of the Wellington Machine Co. Seventeen iron-bound molds, one dump table, all new; never been used. Capacity 30,000 per day. Address
G. W. NICHOLS,
Stockbridge, Mich.

POSITION WANTED.

Position as manager of brick or tile plant, by an experienced man. Can build a complete up-to-date plant and operate it successfully. Address
UP-TO-DATE,
Care Clay Record, Chicago.

FOR SALE CHEAP.

First-class brick and tile plant. Good machinery. unlimited clay supply, 25,000 capacity daily, 3 kilns 170,000 capacity, dry sheds, etc. Track connections, A snap if taken at once. Address
H. C. MODLIN, Secretary,
Perry, Iowa.

ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

PALLETS WANTED.

Wanted 3500 all steel foot pallets, 36 in. long by 10 1/4 in. wide by 3 3/4 high. State gauge of steel, width of foot and general details.
FAYETTE FIRE BRICK CO.
Uniontown, Pa.

FOR SALE.

The Newport brick and Tile plant at Newport, Indiana. Address
JOHN RICHARDSON, Receiver.

FIRE CLAY LANDS.

500 acres underlaid with heavy vein superior fire clay and light vein coal, which can be mined cheaply, on the line of the N. Y. C. & H. R. R. R., in Pennsylvania, for lease on royalty at low price per ton. For further information address the owner.
BOX No. 308, Williamsport, Pa.

FOR SALE OR EXCHANGE.

One of the best small brick and tile plants in Southern Michigan. 20,000 capacity, Stewart patent kilns, good drying sheds, all machinery in first-class condition, fine clay, good market. Will sell at a bargain or will exchange for good real estate.
MICHIGAN,
Care Clay Record, Chicago

FOR SALE.

31-Acre tract of land located in Central Iowa. The finest kind of clay underlaid with coal. Two roads running up to the line of property.
ARTHUR H. LIBBY,
233 Railway Exchange Bldg., Chicago.



Vol. XXVIII. No. 4.

CHICAGO, FEBRUARY 28, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

A REPORT OF THE TWENTY-EIGHTH ANNUAL MEETING OF THE ILLINOIS CLAYWORKERS' ASSOCIATION.

THIRD SESSION.

Pursuant to adjournment of the second session, held in the forenoon, the Illinois Clay Workers' Association met in the third session of their Twenty-Eighth Annual Meeting, in the afternoon of Wednesday, January 24th, 1906, at Elks' Auditorium, Champaign, Illinois.

President John W. Stipes, having called the meeting to order at 2:30 p. m., announced as the first event on the programme a paper on the question "Is the Running of a Brick Machine to its Full Capacity Injurious to the Brick?" by Dr. A. L. Converse, of Springfield, Illinois.

Dr. Converse introduced the subject by remarking that he had assured himself of one element of popularity for his paper, in that it was going to be a very short one.

IS THE RUNNING OF A BRICK MACHINE TO ITS FULL CAPACITY INJURIOUS TO THE BRICK?

This subject which has been assigned to me is necessarily open to many qualifications; in fact, so many that it would be impossible to intelligently discuss it without first defining the meaning of capacity. Capacity means limit, full capacity means full limit.

A man can eat more than he can properly digest, but in so doing is he not in fact exceeding his capacity for eating, and does not capacity for eating hinge also upon his powers of digestion?

It seems to me that full capacity in anything means full ability to do the work properly, and when the desired work is defective, the full capacity is necessarily exceeded.

Therefore if we take the subject as it is literally assigned to me, the answer must necessarily be that no product is ever injured by producing it to the full capacity of the machine engaged in the production.

But I take it that the author of this subject desired that information should be given upon the advisability of rapid work, the resulting product to be taken into consideration.

If that is the object, we deem it important that the kinds of machines used in the manufacture of brick should enter into the discussion, as well as the kinds of brick resulting, together with use to which they are to be put.

Some machines in their operations are continuous in their motions, while others are irregular, a continuous motion can be run at a much higher rate than can an irregular.

All brick machines of the press or plunger type are necessarily

alternating in their motion, and must of necessity run slow as compared with the augur machines which are continuous in their motion.

The resulting product from the slow machines must necessarily be slow on account of the slow motion of the machine, but it must also be slow for another reason which will be apparent to all, when we consider that time is required for the clay from which the product is made to adjust itself to the new conditions, in other words the molecules have been disturbed in the formation of new relations and they must be held in their new forms sufficiently long to make the new adjustment complete.

Perfect brick made on either plunger or press machines, or even reformed on what are denominated represses, will not result when the machine is run to even the limit which its construction will permit.

The continuous motion of the augur machines not only admits, as stated before, a much higher rate of speed from the mechanical standpoint of the machine, but it also admits it from the standpoint of its product.

Clay in an augur machine requires time to adjust itself to the new conditions the same as in the press or plunger types, but it does not require the same time for the reason that it is submitted to the forming process earlier in the operation of the machine, and continues further in its restrained position.

Perhaps I can make myself clearer if I ask you to consider for a moment the difference in the construction of the dies of the different types of machine.

The press machines all have short dies, while the augur machines have long dies with a gradual taper. In the augur machine the clay travels further in the die, and at the same time undergoes a gradual reduction while traveling in the die.

The result is that the formation of the brick by a gradual reduction process causes less disturbance after being relieved from the confinement of the die, and a perfect brick will result much more rapidly than by any other process.

An augur machine can not be run rapidly, and continue to make brick fast, without the machine is kept full of clay. The fuller it is kept the less room is there for air to get between the particles of clay, and the more compact and homogeneous will be the product.

I have long been persuaded that the accumulation of air in the mass of clay after being pugged, is the most fruitful source of lamination, if that is the case is it not evident that the fuller the brick machine is kept, and the less air permitted to mix with the clay, the less the lamination? Now, while this argument may be considered somewhat theoretical, we have found by actual experiment that the theory is correct, and that the more rapid the bar

of clay is forced through the machine at our plant the less the lamination, and consequently the better the brick.

In my judgment the running of an auger machine to its full capacity makes the best possible brick that can be made with that machine, providing the cut-off will accomplish its work as rapidly as the bar is delivered.

I am further of the opinion that all other machines other than the auger machine must not be hurried if best results are expected.

President Stipes: This is something that the machine men ought to tell us considerable about.

G. C. Stoll: Mr. President, I have nothing particular to offer more than what the Doctor has very fully stated. He has covered the subject thoroughly, and I agree with him, that inasmuch as the measure of a brick-making machine's capacity is determined by the number of good brick it will turn out in a given time, it follows, of necessity, that the fuller you keep the machine, not going beyond its capacity, the better satisfaction will be experienced both in quality and quantity of brick turned out. While I have not investigated very closely the subject of lamination, I think that that is something which relates perhaps somewhat more to other causes than will be found in either the condition of the die or the running of the machine; I know that some clays will laminate badly under certain conditions whether the machine is kept full or not.

E. R. Frazier: I agree with Dr. Converse, that the auger machines should be run to their full capacity.

C. W. Raymond: I don't see that I can add in any way to the remarks that have been made. It seems that the brick-making machine will, of necessity, work better when run to its highest capacity—besides getting more brick, you get better brick from your machine.

Warren W. Ittner: I have heard something new from the Doctor's paper under discussion; we were figuring on putting in an auger machine, and being a crank on the subject of running machinery to the best advantage to pay us, I figured that we would get a larger machine and run it slower, and so be able to economize in its operation. Now, I am very glad that I didn't put in that auger machine and spend our money so fruitlessly, for we would have had a machine we did not need and which would not have accomplished its work well, running under capacity. I can readily see that in running an auger machine, to get the best work out of it, it should be run to full capacity, for the reasons which the Doctor has given us—that is, figuring on the line of not making it run too fast, or beyond its capacity. If we had purchased an auger machine and run it to twice our present capacity, it would really have been going too slow, where, with a dry press machine, or some other such machine, it is best to have it of larger capacity, so that you can by running it slow regulate the output to the needs of your plant.

J. W. Hensley: I am not so well posted on stiff mud as I am on soft mud. I agree with the Doctor, that with soft mud the faster the machine is run the cheaper you can make the bricks. If you want quantity instead of quality, then speed up.

W. P. Blair: I am not very much of a brick-maker, but as far as my operations as a brick-maker go, my experience has been the same as the Doctor's—that a brick-making machine that runs easily makes very much the best brick when run as fast as it can be, within the limits of its capacity.

Wm. Hammerschmidt: I have been making brick seven or eight years with a machine. I run the machine as full as I can, but I run it slower for good results. I think the Doctor means not to run the machine too fast, but to run it full for whatever it will make.

Dr. Converse: When you run it full, you are running it to its capacity.

Mr. Hammerschmidt: But then, take a machine with a capacity, say, of 250, you fill it to 200 and increase the speed—I think the large machine runs slow, making it full, will make just as good brick.

Dr. Converse: I don't think it is as easy to make good brick keeping a machine running slow as you can with it running fast. Your gauge will be your guide. I certainly would not buy a large machine to make 20,000 brick per day.

President Stipes: Mr. Powell, how is that on tile?

J. M. Powell: Mr. President, I think that the rule will hold good on tile. I think it advisable, on buying, to figure on a machine of small capacity. I think a machine, like everything else, can be run too fast, and that you will lose from running it too fast. I think a mill ought to be run to about the capacity that it is designed it shall run, and that there should be power always sufficient to keep it running to the full.

President Stipes: The next number is "Sewer Pipe Manufacturers' Troubles," by Mr. A. W. Gates, of Monmouth.

TROUBLES OF THE SEWER PIPE MANUFACTURER

The clay working industry dates back many centuries. When prehistoric man ceased his nomadic wanderings and realized the need of a better dwelling than that afforded by a rude hut made of boughs or a natural cave in the side of a cliff he turned instinctively to mother earth and fashioned his house in a crude way from dried or baked mud.

We have no authentic record of the difficulties which he encountered, but notwithstanding the almost inconceivable advances made in all lines of art, this among others, we still have difficulties, increased in proportion to the more complex forms into which we fashion the same raw material used by him in the construction of his dwelling.

In the manufacture of sewer pipe the clay worker probably encounters no more difficulties than are met with in many other lines of clay industry, but it is by no means an exact science and he has his full share of troubles to contend with. It would seem a very simple matter to mix in proper proportions several kinds of clay, to dry it and burn it, but when the ware comes from the kiln cracked, spalled, blistered and without glaze it is up to the pipe manufacturer to find a remedy for all these defects and it is then that his troubles begin.

The mixing of the clay, after proper proportions have been decided upon, is usually the easiest part of the work, although carelessness here may produce disastrous results in the dry room or kiln. The press and the dry room are closely connected, as a die not properly proportioned or in bad working condition will usually make pipe which is difficult, if not impossible, to dry successfully. In our plant we find that the man in charge of the dryer must never lose sight of the fact that there are two ends to be considered, the socket and the barrel. The pipe is placed on boards, socket up, and after the socket is dried sufficiently to sustain the weight, is turned over and set on the socket. With the larger sizes of pipe, especially, we often experience much difficulty in getting the sockets sufficiently dry without cracking to permit the pipe to be turned before the barrel ends crack. The barrel end next to the board sustains the whole weight of the pipe, which in the larger sizes is several hundred pounds and as it dries it shrinks and must creep on the board. A clay shrinking one-twelfth would cause a creep of two and one-half inches in the diameter of a thirty-inch pipe. While this shrinkage does not all take place in the drying it is a large factor that must always be contended with. We formerly set the pipe on the boards without anything between, later covered the end next to the board with a liberal supply of dust. This we found to be an improvement, but we are now using a sharp sand which seems to give much better results than either of the other methods. Our dry rooms have slat floors and are heated by steam pipe coils under each floor and under the roof. By this arrangement we are enabled to dry the socket and barrel separately or both together.

After the pipe have been dried in the house so far as is possible with a temperature of about 100 degrees Fahrenheit, they are set in the kilns on top of each other to a height of ten or twelve feet. The smaller sizes are nested in the larger ones and on top of all are laid traps, curves, elbows, etc. The kiln setting requires skill

and care and is often the cause of much loss. If each stand is not placed squarely on the ring and independent from others it will be likely to lean over and perhaps cause the whole kiln of ware to tumble over like a row of dominoes.

Now comes the burning, and, as in other clay products, the crucial part of the whole operation. Kiln burning, as we all know, requires a great deal of hard work, and if it is successfully done requires study and good judgment. A little carelessness on the part of the burner or his assistants in neglecting the fires or in firing too heavily once or twice may cause a loss of the combined labor from the clay pit to the kiln as well as a loss of fuel, wear and tear on machinery, etc. We need more light on the subject of burning and more educated men from which to make successful burners. I say educated men advisedly, as this line of work will demand salaries higher than educated men receive in many other lines. The one thing needful is that they must understand the subject thoroughly and be able to put theory into successful practice.

The first part of the burning is a continuation of the drying and in our judgment is one of the most particular parts of the operation. One quick flashy fire or the raising of the heat too rapidly may cause the spalling of half the pipe in the kiln and many times 75 per cent of the large pipe go to the second class pile or to the dumping ground because some fireman in his zeal rushed things too fast. The drying or dehydration period probably extends until a temperature of 350 or 400 degrees Fahrenheit is reached, and in the burning of pipe should continue for about 48 hours. The next stage is the oxidation period and should continue about 48 hours more and until a temperature of approximately 1,700 degrees Fahrenheit has been reached. This second period is also of vital importance as it is during this time that the clay is oxidized, the black core eliminated and the body prepared to withstand the excessive temperatures of the last or vitrification period. If the first two stages have been successfully passed there is little likelihood of damage in the last, although it is an easy matter to carry the heat to a point where the ware will be crippled. Salt glazing is the final part of the vitrification period, and upon its success in a large measure depends the salability of the ware.

There are a number of troubles about burning with which we at Monmouth are continually experimenting, but which we so far have not solved.

Below what temperatures should the dehydration period be confined to prevent spalling? Will a partly oxidized pipe stand as high a heat as one that is thoroughly oxidized? Which will give the more uniform salt glaze, top and bottom, an oxidizing or reducing condition?

When these questions have been answered finally a part of the troubles of the sewer pipe manufacturer will have been ended.

President Stipes: I think we have some sewer pipe men here. Mr. Millsom—

J. H. Millsom: I don't know that I can add anything to Mr. Gates' paper. He has covered the subject thoroughly. I have experienced the same troubles.

President Stipes: You make sewer pipe rather large tile, I understand? Mr. Luther—

Mr. Luther: I make the large red drain tile. I don't know that I can add any more to what has been already said in Mr. Gates' paper on the subject.

Dr. A. L. Converse: I wish to be allowed to introduce here certain resolutions upon the two topics, which at the first session of this meeting had been referred to a committee composed of himself, Professor C. W. Rolfe and Mr. William Hammerschmidt.

1st. Upon arrangements looking to the selection of a beneficiary for a scholarship to be conferred by the University in behalf of the School of Ceramics.

Whereas, The General Assembly of Illinois have provided for special instructions in ceramics at the University of Illinois; and,

Whereas, The University Trustees have provided for free tuition

for one student from each county in the State, the same to be nominated by the Illinois Clay Workers' Association; and,

Whereas, The said Association meets but once a year, and will not have the opportunity at that meeting to make a proper selection at that meeting for such nominations; therefore be it

RESOLVED, That the President and Secretary of this Association are hereby empowered to make the nominations for free tuition in the Ceramic Department of the Illinois State University, provided that said President and Secretary shall be governed in this nomination by recommendations from members of this Association in their respective counties so far as practicable, and when not practicable on account of any county not having members in this Association, the President and Secretary shall make the nomination from the best source of information possible.

WM. HAMMERSCHMIDT,

DR. A. L. CONVERSE,

J. W. ROLFE,

Committee.

A motion was made and seconded that the resolutions on this subject as drafted by the committee be adopted. Carried in the affirmative.

2nd. Upon the advisability of allowing people who may be so disposed to attend at certain periods various exercises and instructions at the School of Ceramics.

Whereas, The Illinois Clay Workers' Association recognize the value to the agriculturists of the State of Illinois resulting from the school of special training during the mid-winter session for farmers; and,

Whereas, This Association believes the same benefit would result to the clay workers of Illinois if a like mid-winter session could be held at the University in which special instructions could be given beneficial to our industry; therefore be it

RESOLVED, That the Trustees of the Illinois State University are hereby respectfully requested to open a school of special instructions in Ceramics, and that the same be held during the two weeks preceding the meeting of the Illinois Clay Workers' Association.

DR. A. L. CONVERSE,

WM. HAMMERSCHMIDT,

J. W. ROLFE,

Committee.

A motion was made and seconded, and carried in the affirmative.

President Stipes: The next subject to be taken up is "Stoneware Glazes," by Elmer Elsworth Spencer, Monmouth. Mr. Spencer has requested Mr. Joannis to read the paper for him.

STONEWARE AND STONEWARE GLAZES.

In order to make this article plain and as straight to the point as possible I think it is best to classify stoneware as follows:

Class One.—Stoneware, or, in other words, hard porcelain, known to the masses as china, the body being extremely white, very refractory and vitreous, very sonorous and translucent and one that cannot be scratched with a steel point. The combination of glaze and body are nearly the same, so that when fired they become a homogeneous mass, a great favorite with lovers of art and the discriminating housewife.

Class Two.—Stoneware having a body uniformly fluxed that cannot be scratched with a steel point. It is slightly translucent, fairly granular and very sonorous, such as Wedgwood mortars and pestles, which is also made in table ware, for instance, Wedgwood's celebrated blue jasper ware, has practically the same component parts in both the glaze and body, whereas in the case of table ware the glaze is generally a fretted one and composed of the following materials: Boracic acid, white lead, calcium carbonate, feldspar and flint.

Class Three.—Crude stoneware, such as jugs, jars, milk pans, etc. The body is prepared from a semi-fire clay generally called potter's clay, a body which when properly fired ranges in color from a light buff to a light drab.

In recent years the glaze is of a metallic nature and compounded of feldspar, oxide of zinc, flint and calcium carbonate.

As this article refers to crude stoneware and crude stoneware glazes, I will say nothing regarding Class 1 and Class 2.

It being requested that I say something on the crawling of the glaze on Class 3, and a method to prevent it, I would first ask, what is the cause of it?

I have heard many different reasons that caused stoneware glaze to crawl in the kilns, from my colleagues. First, the majority attribute this to damp kilns. For instance, if a kiln be put out of service for a period of 6 or 8 weeks it undoubtedly would draw dampness and to put this cold, damp kiln back into service would cause the glaze to creep up in puddles or roll off from the ware entirely.

Second.—The cause has also been attributed to water backing up in the underground ducts of the kiln of a down draft type.

Third.—That in case the ware is semi-dry when it goes through the dipping tub the glaze would peel off, or in case of the ware being dry when dipped and should be left standing over in the dipping room several weeks, it would part and fall off in great flakes, both before and after going to the kilns.

I rather think that any man having the supervision of a stoneware plant, large or small, will be forced to face all three of these above ware and kiln conditions, therefore, I wish to speak from practical experience.

First, that in my early experience I considered it absolutely necessary in case of a new kiln or an old one that had been put out of service and drawn dampness to put the door up and slow fire it for 24 to 36 hours in order to insure good glaze and a safe kiln of ware.

My experience led me to find this method rather expensive, therefore I went to work to overcome this glaze crawling, first, by starting with the body on which a glaze is to be set, and then by adjusting the glaze to fit the body on which it is to be applied.

I have been told that any good stoneware glaze will work successfully on any good stoneware clay. Very probable that might answer with some potters but I assure you it would not be practical.

Talking from what I know of different stoneware clays, I cannot see how they could be called successful; therefore, for example, we will take the two following extremes, one clay high in alumina and low in silica, the other high in silica and low in alumina and the two glaze formulæ as follows:

Glaze No. 1.—Aluminous clay, 38 stone weight, calcium carbonate, 19 stone weight, flint 38 stone weight, feldspar 32 stone weight, lead 20 lbs., zinc oxide 20 lbs.

Glaze No. 2.—Flint 64 lbs., feldspar 128 lbs., calcium carbonate 40 lbs., ball clay 40 lbs., china clay, 40 lbs., zinc oxide 64 lbs.

As to the question in point of water backing up in the underground ducts in kilns of the down draft type. My experience teaches me that there can be no possible effect on the work when the draft is going directly away from the kiln. This plant has now in operation seven 32 feet down draft kilns and during the wet seasons water backs up to a height of 12 inches in the underground ducts and I find it does not affect the ware in any form. Therefore, I must consider that theory erroneous.

Second and Third—I do not believe there is a day in the year but what we are compelled to send ware through the dipping tub that has barely turned gray, also ware that from various causes will be left standing in the dipping room for weeks and in some instances, months, but I experience no bad results from this, and, I may add, we burn all our ware in saggers and that I have caused from time to time several bungs of saggers to be submerged in a barrel of water and left to remain there until thoroughly wet, then immediately filled the wet saggers with ware and placed them in the kiln and found when the kilns were drawn that the experiment gave the glaze no bad effect, therefore, in my judgment, the only thing to prevent stoneware glazes from crawling or falling off is to create a glaze to fit the body to which it is to be applied.

President Stipes: Mr. Purdy, we would like to hear from you on this topic.

Ross C. Purdy: The paper was very gratifying to me, not only

for what it contains, but from the spirit in which it was written. Potters, particularly stoneware people, are inclined to be rather secretive, and stay away from conventions, as they have remained away from this one. I believe that this is the first time in the history of this Association that a potter has come before us with a paper—at least they have not been here very frequently; and I believe that this convention will mark an era, a time, when representatives of all ceramic industries will be in harmony with all forward movements of our craft, such as the establishing of schools, support and attendance at conventions, etc. (Applause.)

As to the subject matter of Mr. Spencer's paper, I was particularly interested in that part of the paper which dealt with the "crawling" of glazes, and especially where he said he closed the kiln without having dried it out so as to prevent "crawling." Mr. Spencer attempted to show us where the line should be drawn between the glaze which will "crawl" and the one which will not "crawl," and, recognizing the fact that dampness in the ware or kiln would cause some glazes to "crawl," he insisted that glazes can be made to fit under even the most trying conditions. We are experimenting with a view of reducing this subject, if possible, to an exact science, but so far we are still much at sea to explain the phenomenon of crawling.

This question may seem to some of you not very pertinent, that is, not to be brought home to you directly, because it deals with pottery. Pottery is not much, if any, more scientific a study than sewer pipe or brick. They stand in many aspects in the same position. The same fundamental principles are involved, and the points treated of in this paper will be valuable as evidence in clearing up certain questions arising with each of you at one time or another. How did you happen to have blistered glazes? stantly, can all be answered on the ground of the common fundamental principles underlying each.

Albert Veioch: I don't think that I can add much to the paper, or to what Mr. Purdy has said, further than to ask Mr. Purdy to recommend, or give us some recommendation of what would be good to stop "crawling."

Mr. Purdy: The question lies in the fitness of the clay, of course, and requires considerable study. But, in general, a soluble salt used in the glaze, so that in drying it will crystalize and unite the glaze, is a capital way. Now, some clays have a slight admixture of salts naturally, and in this case the addition of the soluble salts in the glaze may be unnecessary. I don't believe that the action of the soluble salts is clearly understood by any one as yet except that they do counteract crawling. There are various soluble salts that can be used in this connection, as, for instance, borax, boracic acid, soda ash, plaster paris "slop," etc. As to what particular salt is best is a matter of actual experiment.

Albert Veioch: I would like to say one more word regarding soluble salts. Soda is a very apt thing to use as a soluble salt, and it seems to make the glaze run—take the jar and turn it over and it seems to have evidently run down in streaks on the ware.

A. W. Gates: Mr. Purdy's remarks were of great interest to me. I don't know whether it would be considered the place to discuss the subject right here, or to what extent it is related to the matter that is now under discussion—but there is the question of "Black Core." Has there been any discussion on that? We are troubled a great deal with "black core" in sewer pipe manufacturing, and probably manufacturers of brick have the same trouble; maybe they have discovered some way of overcoming it. I would like to hear something on that subject.

President Stipes: Is there anyone that can help Brother Gates out?

W. T. Boyd: I have never had any experience in sewer pipe. My experience has been with building brick, and that the trouble lies in the degree of moisture in the different kinds of clay, and the success in avoiding the trouble depends on your success in properly drying the clay and on the time you take to dry it. When the clay comes right to the point of burning, you have to hold it right there until the water gas gets out of it before they can finish

raising the heat. And right there, in my experience, just when you think the gas has gone—just at the point that you are getting rid of the water gas—is the critical juncture, and the point is to allow the escape of the moisture or water gas before the clay has ceased to remain porous.

Mr. Gates: It couldn't of course escape after the outside of the clay has become vitrified, and the conclusion is that the temperature should be kept below the vitrifying point until the carbon gas by burning has become expelled from the ware.

Mr. Boyd: We might put in a few of the ashes from the boiler to help the drying, if convenient—throw some of those in while the wall of the kiln is damp. I think we have had about 100,000 of the "black core." It would seem that there should be enough carbon in the ashes to show whether the theory be correct.

President Stipes: Mr. Blair, there seems to have been some trouble with "black core" in sewer pipe as well as in brick. Perhaps you can tell them something about it.

W. P. Blair: I would be very glad to have someone tell me something about it. I will say that matter has been of more or less trouble to us. The most satisfactory way I can think of along that line of investigation and endeavor is to embody the points in a series of questions which I did on one other occasion when the matter was up; and in connection with the answers to those questions, we may perhaps learn "where we are at." I had them all arranged on a sheet of paper, which, of course, is not available now; but I said, as nearly as I can recollect (perhaps I will not get them right just as I arranged them), first, I wanted to know the condition of the brick when they were set, whether wet or merely damp, or entirely dry; then, after the first twelve hours (I want a draft and necessarily a low fire) I want to know the condition of the brick at that time; I want to know or have an impression of the condition of the draft, of the fires, the condition of the draft at the bottom of the stack, and the condition of the smoke as it comes from the stack; I want to know that same thing also at the end of twenty-four hours, and any condition relating to those questions I have just asked. I want to know the condition of the brick at that time, and a trial of the brick, of course, to ascertain whether any evidences of "black core" were shown then, and the condition, as it was then shown, of the smoke at the top of the stack; and some eight or ten questions could be drawn up having reference to the side measurement and the thermometer. Then I want to know, at the end of forty-eight hours or of thirty-six, the answers right through to those several questions. And I would want to know, too, as to the temperature, the highest and the lowest, that has prevailed. And it is probable that by pursuing that line of investigation, following it up persistently, taking the temperature and observing conditions every ten or twelve hours, you will be enabled to discover, distantly at least, the cause of the trouble and those particular conditions that govern "black core." By measuring the condition of your fire you will be enabled to know when the carbon is going out, you know whether the fires are being kept pretty well up; and I undertake to say, as smart as some of us pretend to be, that if we look into this subject at proper intervals and with that degree of care and attention which the matter demands, in a fire ranging all the way from 1,200 to 1,800 degrees, there will be discerned to have been a variation of 200 degrees—that is to say, you may come along there in the morning and find the temperature 200 degrees lower than it was the night before. Now, that is about the condition of things, and whether the fireman has been attentive to conditions during the night or not, and he may be burning coal to beat the band during all that time, too.

I do not believe in burning without the exercise of the very ought to take just as particular care, pursuing practically the same course (and by pursuing it many of our troubles will be avoided), as is pursued in the Rookwood Pottery in Cincinnati, the Buckeye Pottery and in ten, twelve or fifteen others; and for all the trouble it takes we will be amply reimbursed by the advantage we will gain by using all this close care and observation. It is as valuable to the brick men as it is to the pottery men to have good fires, and

we ought to know exactly, within 25 or 50 degrees, how our fires have varied and to what degree they have been kept up or allowed to diminish from the required temperature. Of course, it ought to vary a little bit, and there will be a little difference in the quality of one brick from another; one brick will differ in various ways from another, dependent even on the dropping of a little piece of something in the mold, or a brick may be a little more compact in one case than another; and the boards being sealed up, it takes longer to take out the carbon. And bricks vary in the amount of carbon contained in them—no two bricks have the same amount of carbon; it is a good deal like in the making of iron—there are no two pieces alike on the face of the earth.

Dr. Converse: Mr. Chairman, I think in all conventions that I have attended, and I have attended quite a number, I do not remember an expression upon this subject to the extent that I have heard it discussed here in the five or six minutes past; and from the emphatic way in which Mr. Blair speaks of it, I infer that it has not uncommonly come under his observation. Now, it is a matter that troubles us not a bit. We have a kiln, and we have always put into it brick that has been properly dried; and we have never had a particle of difficulty with our dried brick—and with any brick, it has been so small as not to be worth considering. And it must be, as it seems to me, I not being the only party who uses perfectly dried material, that it lies in something that is in the material brought into the product, that causes this trouble.

Mr. Blair: Doctor, allow me to ask you one question at this point. At what degree of heat is the carbon burned out of the brick?

Dr. Converse: I do not know.

Mr. Blair: Well, if you do not know that, how do you know but that it would have to be burned out at 800 degrees, and if so, how do you know that in raising your fire from 800 degrees to 1,350 you might not be throwing away—or have thrown away during the last five or six years—without any advantage to yourself, a ton of coal for each thousand of brick?

Dr. Converse: I know very well that I have not thrown away that much, for I have not consumed or used that much coal.

Mr. Blair: I put that quantity by way of illustration. How do you know but that you may have lost a quarter of a ton of coal per thousand of brick in this way, during all that time?

Dr. Converse: I simply know that I have not used coal in excess of others who are in the business of manufacturing brick. I have found out that we have made brick at a profit. I rely on the judgment of my own superintendent more than on my own, and I know we have no difficulty to speak of; and that is what surprises me. It seems to me that in some localities there is more trouble than in others. I do not know how it is in Galesburg, but from all that I have heard from that quarter, I have not heard of them having any troubles of that nature. It is new to me.

Mr. A. W. Gates: I think that the composition of the clay undoubtedly has a good deal to do with this trouble. I do not believe that the drying has anything to do with it directly. Of course ware, when put in the kiln when green, if it has not been dried in the drier, must be dried in the kiln; but from experiments we have made and investigations carried on, we find that the "black core" is not taken out until we have reached a much higher temperature than is necessary to thoroughly dry the ware. As I said in my paper, I think that probably all the water is out by the time a temperature of 400 or 500 degrees is reached. We cannot eliminate the "black core" from our clay until we reach a temperature of 1,600 or 1,700 degrees, and then cannot always do it. It is something that bothers us a great deal, of course.

It is a question whether a piece of sewer pipe or a brick is not just as good with the "black core" as without it; but it seems to us that the ware will stand the final stages of burning very much better when the "core" is out than it does when in.

Mr. W. P. Blair: It has been suggested to me right here by Mr. Barr that Professor Orton's paper on that subject handled this question with very minute satisfaction to nearly all who lis-

tened to it; and since that paper was read, it has been published in pamphlet form. I merely make this statement to the Illinois Clay Workers' Association so that they may be thoroughly informed on that question. I believe some of the brothers have the Professor's pamphlet on that subject. I know that I have perused it with a great deal of satisfaction, and I believe have derived great benefit from it.

Mr. Purdy: The experiences and opinions of manufacturers and others interested in the clay burning industries differ widely, sometimes even running contrary to one another, dependent more or less upon conditions and accidental circumstances but imperfectly known or understood. One manufacturer, for instance, says, "I aim to fill the kiln, course upon course, setting the ware uniformly as may be, and in such a way that we shall know that the majority of the brick are absolutely dry, and we never 'kiln' the brick without their having had a few hours at least in the dryer, and invariably that few hours' run will do it." He said he had experienced no trouble to speak of on the score of "black core."

At another place, I asked the gentleman how he set his ware in the kiln for burning, dry or damp. He said that he did not have it dry; that his brick went through the drier process not perfectly but partially dried, and in some cases just dry enough so that they could be handled, finishing the drying in the kiln. Yet this second gentleman knew nothing about "black core."

Now, whatever may be said as to this practice of drying or not drying brick previous to setting the kiln, every clay has carbon in it, and that carbon must be thoroughly burned out. There is silica and iron in nearly all clays, and under the application of heat at a certain stage, the iron readjusts itself, going into combination as a silicate. If this combination of iron and silica takes place in an atmosphere devoid of oxygen, i. e., a reducing atmosphere, a black ferrous silicate will follow. It is the combination of silica with iron, under reducing conditions that causes the "black core."

Now, how to eliminate this I suppose is the more important question. As indicated in my first remarks, it takes place at a certain degree of heat, generally at a temperature of between 500 and 800 degrees of what is known as Centigrade scale, and the iron will not be reduced because the clay has an open structure. But if you should raise the heat through this range of temperature rapidly and seal the brick or tile on the outside, before the carbon on the inside has burned out, further oxidation of this imprisoned carbon can not take place except as it feeds on the oxygen readily given up by the iron. That is, not getting oxygen from the outside, the carbon will find something upon which to support combustion on the inside, and the ferric or red iron oxide will give up very rapidly the one element so necessary to support this combustion. Being thus reduced the iron readily slags with the clay, forming what we call a ferrous silicate. This ferrous silicate is the "black core." It is not carbon but the effect of carbon.

Mr. Gates: It is usually with the larger sizes of pipe, after you get up to from 18 to 24½ inch and above that, that the most trouble is encountered.

Mr. Purdy: You cannot tell from the outside of the pipe whether or not it is dry on the inside. As I understand, the large pipe takes up so much floor space in the drying rooms you hustle them into the kiln as soon as possible for if you don't they would soon crowd you for space for the small pipe, and in this way or for that reason your large pipe are not as dry as they should be when placed in the kiln.

Mr. W. P. Blair: Mr. Purdy, it is of the utmost importance that we know that degree of heat, that point, at what time these changes are going to take place; when this is true of your ware and when that is so—the changing conditions—when it is. And can you raise your fires rapidly without injury?

Mr. Purdy: 500 Centigrade, or 900 Fahrenheit, is the beginning of the period in which we find the carbon prepared to burn out. When the heat first reaches this point the brick is all black inside. If you hold your fire at 900° F., you will see that the black

center decreases in area until in time it will disappear altogether. Now, 1,450 degrees Fahrenheit we find is about the highest temperature at which it is safe to burn out this carbon; for in going beyond that, the outside of the ware becomes scaled and the escape of the gas is prevented. For that reason, you hold your fire below 1,400 degrees till all the carbon is burned out.

Mr. Blair: This is the point I want to bring in: When do you ascertain, at what point can you be sure the result has been or is being attained?

Mr. Purdy: There is no use of pulling trials until the temperature rises to about 1,400 degrees.

J. M. Mamer: Mr. Chairman, the first convention I attended, I think it was at Springfield, in January, 1895, Dr. Converse had just started with his plant, or it was shortly before that, and Mr. Odell, his manager was running it at that time—when Mr. Flager brought a couple of dried brick over so we could see them. He put his brick in the top of a kiln of tile he was burning at that time, and they had that furnace pretty near 3,600 when it started; and he said that when he pulled that brick out of the kiln it was like a loaf of bread. We took the samples of brick home, and I burned them in a kiln where we had some large blocks—forty-five or fifty hours we burned the brick, and when we took it out it was in very nice condition. That brick was burned quick, and when we took it out it was like a loaf of bread.

J. D. Jansen: I would like to ask, generally, what would be the color created by 900, or 1,400 degrees?

Mr. Purdy: At 800 it is just faintly red, and at 1,400 it is quite bright.

F. F. Bentley: Mr. Chairman, I would like to ask Mr. Purdy whether sewer pipe, after once being thoroughly oxidized,—is it possible for the carbon to be burned back into it?

Mr. Purdy: No, sir.

Mr. Bentley: Another thing: Does a pipe, thoroughly oxidized, stand as high as one not thoroughly oxidized—that was red, but was burned black by heightening the condition of the fire?

Mr. Purdy: No.

President Stipes: Gentlemen, have you about exhausted that "Core?" If you have concluded discussion on that subject, Mr. Martin W. Lauer, of Chicago, will speak to us on "The Clay Building Block Industry—Its Death and Resurrection." (Applause.)

THE CLAY BUILDING BLOCK INDUSTRY: ITS DEATH AND RESURRECTION.

Mr. Lauer: Mr. President, and Gentlemen: I feel like an interloper here this afternoon. I should have come in the morning.

As some of the discussions have been lengthened out considerably, it is a serious question in my mind when I size up the matter of the number of building block manufacturers present, whether the gentlemen who are here will be interested in the subject, and I feel constrained to pass it by. But I will try to make it as short as possible and cover only the points that I think are essential.

You will probably ask yourself the question and perhaps arrive at the same conclusion that many of us do when we buy a new book because of its title; after we have finished reading the book we wonder what relation the subject matter of that book had to its title, and we decide that there was not any relation whatever; and the same, perhaps, may be said of the relationship of my remarks to the subject given me here—The Clay Building Block Industry—Its Death and Resurrection.

I do not intend to usurp or assume the functions of the Almighty, and won't attempt to resurrect what is really dead. If this industry be really dead, I believe in and will do what the physician does; when he gets through, he calls in somebody else.

Then, the question before us is, or will be, "Is the Industry dead, or is it 'playing possum'?" Let us see.

About sixteen years ago, there existed in the States of Illinois and Indiana three factories, as near as I can remember (and what I say to you will approximate the facts—I do not pretend to give you exact facts); one of these factories had as an adjunct to its business, and it was considerable of an adjunct, the manu-

facture of hollow building block—a hollow building block plant. Two other plants devoted themselves to it. We will call them plants, "A," "B," and "C,"—three plants in the Hollow Building Block industry. Plant "B" was the largest of the three, and devoted its entire output to this industry. Plant "C" sometimes called a two-kiln plant had really one kiln—26 feet one, and the other so situated with reference to utility as to be unavailable for blocks, so that, as a matter of fact I always called it a one-kiln plant. They made blocks there until they had a kiln full, and would then lay off till after they had sold out the kiln-full of blocks, then would make another.

That was the condition of the industry sixteen years ago. Manufacturers then were thoroughly imbued with the idea that there was a great future for the blocks, and for that reason they were not slow in taking up the business. They came from Ohio, and you know the great men of the country, (with the exception of Illinois) come from Ohio. They started to do what all of us strive to do with a new industry, and that is to find a market for the product; and if there is no market, seek to create one. They started to do this.

The work was slow, tedious and discouraging. As salesman in that line I began very close to the beginning. And it was hard, running and working almost constantly, to introduce this new material and create a demand. I remember one night I went home quite happy, because a certain contractor in the building line whom I had been soliciting had given me great encouragement. He said if I would come to him early in the morning he would give me an order for hollow block; and I went out about six miles from town the following morning ready to take the order; and he said, "Well, I will tell you, I have been sleeping over this, and I think I will let somebody else do the experimenting." And just such stories could be told time and time again. But the manufacturers persisted, and gradually there came to be a demand, and the demand increased rapidly, and the business, judging from the expressions of the heaviest manufacturers, was profitable; although some of them would lead you to believe it was not. If you asked them at their plant about the hollow block business, they would say, "Well, it is not very good;" then wink the other eye, and you would know what they meant.

That continued until about the year 1904; and what was the condition then? Instead of three plants, we find in existence in the states west of Ohio, feeding exactly the same territory, nine plants; and this little one-kiln plant I told you of, instead of being a one-kiln plant, is an eight-kiln plant; and all the new plants started out with ten or twelve kilns and were laid out for twenty-five. Most of these plants were adjunct plants.

All at once, something happened,—at least the manufacturers discovered something. What was it? They found out that business was not what they thought it should be. The demand was kind of falling off; and they got together and called in a board of experts, physicians in the case to feel the pulse, and laid the case before them. They said, "This industry, that had been a weakling at first, had grown up to be a giant in stature and had promised to do well, but had suddenly shown signs of ill health—failing health," and they told these physicians, experts, that the industry was now in such condition that they thought it was dead; and they asked these physicians to examine and report. They made the examination, and found a very faint pulse, the existence of a comatose state—I don't know whether they call it "comatosity" or not; and they found the business suffering from complete closest kind of care. I have come to this conclusion: that we exhaustion. The board of examiners brought in their report. They said they thought the trouble was brought about by three things; first, over-production, second, under-consumption—and you gentlemen in the brick business, or in fact in any other business know to what those two things lead when you put them together, and where you will bring up. You raise three plants to nine—or, just to give you a small idea, say just quadruple the capacity, and then minimize down to the lowest point the consumption—and there is apt to be "something doing." New manufacturers who jumped

into the business could not understand what the matter was. They had invested forty to fifty thousand dollars in the plants, and the stuff was not moving out of the yards. They did what others do—cut the price a little—and the other fellow thought he ought to do the same thing, and they kept up the merry game for some time. Then, that did not increase the consumption. What was wrong?

They went back to the board of physicians, and said, "You told us of two causes of the trouble with this business, but there must be something else. What is the third cause?" And the physicians replied, "Well, gentlemen, we didn't care to tell you of that cause because we knew you would not take kindly to it. You know, gentlemen, a man may become very ill with one or two troubles which may not be enough, however, to keep him in bed, until usually some third trouble more serious than the other two comes along and puts him on the flat of his back; and, we are sorry to say that this looks as if it might be that third trouble—a new trouble. It is so recent that we have not been able to get a very clear idea of it. We have just been able to find a name for it, and of course that name must be given to you in Latin—we always give these medical terms in Latin; and this new disease which we find is making the most trouble with our patient, the third cause for his present condition, is known as *Hollow Concreteitis*." (Laughter.) "Now we know "oshrd shr cmf cmfo ocm ocmocmfw (Laughter.) "Now, this disease may be curable, but we don't know the remedy yet. We know that it is a microbic disease, is caused by a microbe; and that microbe, so far as we have observed, has gone all over this middle country,—east, west, north and south. It has touched at every little hamlet and at every city and village,—every place where the railroad has touched and human beings are, there that microbe has found a lodgment. It has attacked the wealthy and important men in our town, as well as the humble mechanic,—it has stung them all. And the results! A few minutes after the sting, the banker comes around town talking thus: 'Gentlemen, have you heard of this new thing, this hollow concrete block?' And the mechanic, who probably does not have any money, immediately after he is stung, becomes possessed of the idea that there is something for him to do besides following his trade or working as a laborer, and he immediately gets this disease and can talk of nothing but 'Hollow Concrete Block;' and the result is a race between the banker and the hod-carrier as to who can get the first machine for making the hollow concrete blocks in town."

Now, gentlemen, that is the trouble. Last year it was comparatively new, so new that manufacturers of it thought it necessary to scatter hollow concrete block literature everywhere. It has taken possession of that clay manufacturer, our good brother Hammerschmidt, and he last year had on exhibition here three blocks, which resulted in a little misunderstanding and created considerable merriment and amusement; for when I came in first and saw those blocks there, I thought I had come into a hollow concrete building block machine convention, or something of that sort. But that was one of the times when I was mistaken.

I have been mistaken, I will admit, and have changed my views—some of them. And in the spirit of fair play, of which we boast as Americans, and in order to demonstrate the fact that I appreciate that we have arrived at a cycle of "square dealing," as President Roosevelt says, I want to acknowledge that I have changed my ideas in some respects regarding this hollow concrete block matter,—this material which has caused us so much trouble. I am satisfied that the introduction of the hollow concrete block has done more to stagnate the hollow clay block industry than any other thing; and I am satisfied that had this material not intervened and come into the market there would not have been an over-production, that the diversion has withdrawn from the hollow clay building block trade that which would have served to stimulate the demand that should have consumed the extra quantity produced. I will cite you one case showing this result, out of a hundred others. I used to have a customer who would buy from five to eight car-loads of hollow clay building blocks each year; and, suddenly, after years of business relationship, he

cooled, and I couldn't even get a pleasant look out of him. Then I wrote him, and my letters were unanswered. Finally, I wrote him a letter which was so prepared that all he had to do in making reply would be to put his check mark opposite the word "Yes," or "No," with reference to the order for blocks, and enclosed a stamped and addressed envelope for return mail. He answered that letter by writing across the bottom of my sheet, "Dear Sir: Am using no more clay blocks. Have a machine of my own, making concrete blocks. Yours truly." Now, this man was the only material-dealer in that town, and if I could not sell to him I was out of it; and I have been out of it ever since.

I said last year that I did not think much of the hollow concrete block as a block. Well, I don't think much of it yet. I believed, a year ago, that one year would put the block out of existence. From what I had seen of its absorbent quality,—aside from the fact that it was being made by Tom, Dick and Harry,—and Hammerschmidt, (Laughter),—I thought that that, in itself would kill the business. (Applause.) But I want to confess, gentlemen, and my dear friend, Hammerschmidt, that I have been greatly mistaken; and I humbly wish to acknowledge, in the presence of the gentlemen who were probably present a year ago, that I firmly believe that hollow building blocks of concrete will be made in greater quantities this year, and next year and the year to come than any year preceding—I firmly believe it. If I should tell you anything else, I would be telling you an untruth; and I make this statement fully conscious of the fact that about two-thirds of my bread and butter depends on finding a market for the hollow clay building blocks.

A man approached me some time ago, and wanted to take me out to dinner. I said, "Very well, I will be hungry at half past twelve." We had dinner, and judging from the place he took me to, I said to myself, "I wonder what he wants?" But we had a good dinner, and were smoking afterwards—and it was a very good smoke. We talked of the weather, the markets, and so on; and finally he said, "Say, don't you know that you could be making a great deal more money than you are making now?" I said, "Is that so?" "Yes," he said, "and I am going to put you in the way of making it." And what sort of a proposition do you suppose he ladled out to me? He had a hollow concrete block making machine he was manufacturing, which he proposed to sell and was at the time selling, putting on the cars with all the accouterments that go therewith, for the small sum of thirty dollars; and he said that if I would take hold of the handling of that machine, there was \$15.00 profit apiece in it for me. Now, probably some of you gentlemen have circulars of that machine that is selling for \$30.00; if you have not, you will get them I think.

Now, you can see for yourself that when you can buy a concrete block machine for \$30.00, every hod-carrier can start in the business, while it takes forty, fifty or sixty thousand dollars to start in the clay business. If they have not got the thirty dollars, they can borrow it from a friend, or, I am satisfied that the machine man will let him take the machine and pay for it on the installment plan.

Now, that being the condition of affairs, is it not reasonable to suppose that there will be thousands of machines sold this year; and maybe they will reduce the price next year, and there will be other thousands sold; that out of those thousands of men who start in the business, some thousands will fail; but a certain fixed quantity of men will stay in the business, they have such absolute faith in it, and they have ways, too, of doctoring up the wavering faith in others,—like Hammerschmidt, who takes a block of the concrete variety and soaks it in boiled linseed oil for six months, and then brings it to the convention to show that it is, of necessity, water-proof. (Laughter.) Yes, they will stick, a certain quantity of men will stay in the business they have such absolute will be concrete blocks on the market, galore,—bad, indifferent,—and some good.

Now, one of the clay men remarked to me, "You are wrong. The country is growing out of the market. Down in my town," (and by the way, it is Terre Haute, and you can guess who the

gentleman is—and he is a very good friend of mine), "down in my town they are not putting them in any more. Last year I didn't sell enough clay blocks to fill a small sized kiln, and this year they are putting my blocks down in the ground, to grade, and putting the concrete blocks above." That explains, in some degree, about the concrete block. There is something about it that appeals to the man who is building a house, or is about to build one, and the man who ultimately buys, or the woman; they really don't know one thing from another when it comes to selecting the material. They are incapable of distinguishing between the essential qualities, judging of the real merits of this or that; and they have an idea like this: "Here is a material that looks like stone, and to all intents and purposes is stone." It has a good, substantial appearance—it looks well—and of course the man who sells it overlooks the fact and does not state to the buyer that it absorbs moisture all the way through. He says nothing about that, and the material is used.

It is its resemblance to stone that is making the market for the concrete block. The clay block stands for what it is, not upon its resemblance to this or that. But take that point of resemblance from the concrete block, and as compared with the clay block that can be wrought into diverse or regular form and the concrete block is not a "thing of beauty." But, nevertheless, it has a resemblance to stone, and in that respect is more attractive to the eye, and people want it for that reason for basement walls, and for that reason the hollow concrete block is in the market, and is going to stay in the market.

I don't want you gentlemen to get the idea that I am maintaining that there is no market for the clay block; because if I thoroughly believed that, I would "stack up" with the concrete machine man at "fifteen dollars per machine." I believe that there is a clay block business, but it lies entirely outside of the field of endeavor so far pursued by the manufacturers. I believe there is a field for the clay block man from an architectural point of view which will make the material as desirable as the various grades of building material; and while the time is not now, (nor do I believe it will be next year nor the year after), the time is coming when those manufacturers who are still in the business will have learned where that field is. A great many manufacturers who think they have reason to believe that there is no such field, or some of them, still hesitate to entirely give up the clay block manufacture, and we find them holding both eyes in full gaze in the direction where they think they will find a few orders for the blocks; not taking their eyes away from that objective point for a minute, they are feeling around for some field to experiment in—with chimney blocks, and with this, that and the other thing, trying to find something into which to gradually slide from the clay building block industry.

I believe, and I feel it deeply, that the manufacturers of clay blocks who remain in the business will, after several years, find a field which will raise the hollow clay building block to a higher standard among building materials, take it away from the exclusiveness of basement foundations, and place it where it belongs—to a place by the side of brick for entire structural purposes.

I thank you, gentlemen. (Applause.)

Dr. Converse: Gentlemen, down at Springfield we don't care anything about these concrete blocks, or the hollow clay blocks. But I think Hammerschmidt is a hammerer, and if anything is to come out of this I want to be on Hammerschmidt's side, because he is the largest around the abdomen. I am with Mr. Hammerschmidt at this time. (Laughter.)

President Stipes: Mr. Hammerschmidt, defend yourself.

Mr. Hammerschmidt: First, I want to call the attention of Mr. Lauer—where is he? (Laughter.) I want to say that neither I nor the company that I represent ever believed that the cement block is going to take the place of brick in the construction of the wall, or that it will take the place of clay block of any kind to any great extent.

A firm—I have forgotten the name of the firm—sold a six-room house, and a local building and loan association advanced to the purchaser six hundred dollars on that house. The house was made

of hollow block, and was supposed to be, or should have been, water-proof. The building and loan association got the house, and an old friend of mine bought it of the building and loan association. The next year he came to me and said, "William, my house is falling down! How can you help me? I got beat." "Oh," I says, "it's not as bad as that." But it was crumbling off, or breaking in, the whole length of one side; and the house was bent—the walls a little sideways. And I sold him brick to put eight-inch walls on that house.

The hollow cement block people, when they commenced, made mistakes, and many of them, too, and I suppose we will make them, as all do.

I came here to talk cement blocks. I have been a clay man for eight years. Our company and one of the companies I manage, make cement blocks. The test that we have made of the cement blocks in one year is sufficient to show us that they will stand. There are six houses, three built of cement material; and I will say that every one of those houses, if we had not built them of cement blocks, would have been built of wood. Good cement blocks will replace lumber, not brick. It will never take the place of brick or brick material.

That is all I want to defend—cement blocks.

Mr. Lauer: I want to ask Mr. Hammerschmidt whether that house he speaks of was built by a shoemaker or a bricklayer?

Mr. Hammerschmidt: I want to say that it was built about the year 1892—a good six-room house, of a dark shade of hollow block.

We make a good cement block. We were the first to make it in our section and to do business with it. We run two machines with three men—all the men we could get—and we never were less than four to five thousand behind orders. We have orders for three houses now to put up, and I don't know how many basements are waiting for those blocks. This machine cost \$125.00. You can buy a machine for \$40.00, or near that price.

H. E. Shaw: Mr. President, I would like to ask Mr. Hammerschmidt a question. He speaks of this house, that if it had not been made of concrete block, would have been constructed of wood. How does the cost of a brick wall compare with the cost of concrete? Will not a concrete wall house be cheaper than brick, and more serviceable?

Mr. Hammerschmidt: The lady came out to the plant who wanted this house, which was to be about 40 by 35 feet, or nearly a square house; and she said she would put on a slate roof. She had a bid on labor, and she didn't want brick, she wanted either frame or cement blocks. And of all the houses we furnished material for in cement blocks, we could not persuade the builders to use brick. They would have the one thing, cement blocks, and no other, and if they couldn't get the cement blocks they were going to build frame houses. We furnished those blocks for that house from the cellar, an eight-foot cellar, from the bottom up, for \$532.00, and freight over to the house \$59.00.

Mr. Shaw: I want to state that we will build of brick a structure of the same dimensions for the same price, and I will guarantee that it will carry more weight.

Dr. Converse: Mr. Hammerschmidt, I understand, is not studying so much the difference in weight, as the difference in cost. His is cheaper than a wood house.

Mr. Hammerschmidt: No, it was not. Every contractor was against brick. A contractor said, "I will put that house up for you for \$3,600.00," and he wanted \$100.00 more for a porch, and other things, and high sills, and cement steps. But he said, "I will take the cement blocks," and you see that is how it is. I protest against cement blocks as much as anybody, where the clay blocks should go, but there is not one of them who will put that facing on. The sand block I am opposed to, and won't make it. I have got permanent material in there—in all my brown stone.

J. M. Powell: Mr. Hammerschmidt, how much do you sell that cement block for?

Mr. Hammerschmidt: We sell that at 14 cents smooth face, or any face for 11 cents.

Mr. Shaw: What are the dimensions?

Mr. Hammerschmidt: Eight by sixteen.

J. M. Mamer: Mr. President, we have been making hollow blocks five or ten years, and we have had various experiences, and have come to one conclusion: That if a man wants a foundation for brick, we recommend him to use hollow block inside and face it up with brick outside. This invariably gives the best satisfaction. When we first started in, we had a number of cellars walled with just a single facing of hollow block, and they didn't stand the weather. The worst trouble we had was at the ends of the blocks. Although the mortar was unusually thick and good, it seemed that the expansion and contraction in the block eventually loosened that mortar. By putting the four inches of facing brick outside, we can make a wall second to none. I built a whole house myself—built it from the bottom of the cellar up to the roof, faced four inches with brick on the outside and hollow block inside, and I am satisfied that I have a warm, dry house.

D. E. Morey: I want to ask the brother if it would not be as cheap to make it a 12-inch wall, all brick, making it a hollow wall?

Mr. Mamer: No, not quite as cheap as in the laying of the hollow block, as well as in the small amount of mortar. And, besides, you have a better non-conductor of heat or cold, and you have a drier wall.

D. E. Morey: What proportion of cement do you use?

Mr. Mamer: Using all clay blocks, no cement at all.

I believe the most sensible clay block made is one where the openings will run perpendicularly in the wall, instead of horizontally; because then the narrow points of contact will be where they can expand and contract without any opening, which is not the case where the openings are horizontal.

President Stipes: Is there anything further on this subject? I will say that my experience has been somewhat similar to Mr. Hammerschmidt's. I sold some of these cement blocks—induced a buyer to take some, and when we got them on the ground we couldn't get a bricklayer to lay them. We had them sold for one house, and the contractor insisted on using them. We had to send to Mansfield, Ohio. The foundation of hollow block was not our own undoing. This man was an Ohio man, and was accustomed to these hollow building blocks. We had the blocks laid on their foundation, and guaranteed the work. In all the joints the mortar is very loose or has fallen out. We found we could not sell the hollow clay block, and that was all there was to it, and as a result we went to making hollow concrete blocks.

Mr. Hammerschmidt: Gentlemen, how many members here are making cement blocks? Hold up your hands. (Four members were indicated by the hands held up.) Three or four.

Dr. Converse: Inasmuch as the majority have not held up their hands, I don't think I will hold up mine. (Laughter.)

President Stipes: Can you prove to the boys, Mr. Hammerschmidt, that you didn't soak that cement block in oil? (Laughter.)

Mr. Hammerschmidt: Yes, sir; there is no oil in that block. (Laughter.) I will stand up and swear to it right here. That block there is just as it is regularly made; and, gentlemen, I only brought this block here because I knew my friend, Lauer, was coming down here, and I had them to ship it down.

W. T. Boyd: Mr. Hammerschmidt, we would like to know if your brick won't take moisture?

Mr. Lauer: How about the manufacturer? I believe, if Mr. Hammerschmidt does not, that his block will take water. (Laughter.)

President Stipes here announced, as the next topic on the program, "The Origin of Clays," by H. B. Fox, Instructor in Geology, University of Illinois, Urbana.

ORIGIN OF CLAYS.

Perhaps in beginning this subject it will be a good plan to first glance at the earth as a whole. Our planet is believed by most scientists to be a solid sphere, but intensely heated in the interior. For our purpose, however, we need consider only a thin outer shell. We know this shell is made up of many different kinds of materials. We see, here, a mass of granite or other crystalline rock,

there, thick layers of limestone or sandstone, at other places beds of clay, sand, or gravel, and usually covering all of these a layer of loose soil of greater or lesser thickness.

For the purpose of this paper, however, all of these different kinds of rock may be divided into two groups: the crystalline rocks and fragmental rocks. In the crystalline series we shall include all rocks that have come into their present condition by cooling from a melted mass or that have been so highly heated and subjected to such pressure and action of hot water that the whole mass has been metamorphosed and changed to silicates so far as its composition will permit. With the fragmental rocks we shall group all rocks, whether loose or compact, that have been derived from the breaking down of pre-existing rocks by whatever process. The fragmental rocks form by far the greater portion of the earth's crust.

If, now, we examine the earth's make-up from without inward, we are able to make a new division of its mass. As we pass inward from the surface the temperature is found to increase about 1 degree Fahrenheit for each 50 feet in depth. Again we find at a certain depth, varying for different places, that the rocks of whatever kind are constantly saturated with water. The upper or outer surface of this saturated layer is called the water table or upper surface of permanent ground water. Outside of this layer the amount of water in the rocks is variable and almost always more or less in motion. It is in this outer layer that most of the destructive agencies that are manufacturing clay are at work. The most important of these agencies are water, chemical agencies, change of temperature, and life. The action of water is both mechanical and chemical, but the chemical action we shall discuss with other chemical effects. Some of the results of the action of running water are easily seen. After a heavy shower the water of any stream in the neighborhood is found to be roily from the greater or less amount of fine rock materials being carried by the water, such as sand, silt, clay, etc. Clear running water has very little power in breaking down or wearing away the rock over which it flows, but when provided with a supply of rock debris like sand and gravel, its cutting power becomes very great. Examples of this power may be seen in numberless places but the best known and most striking example is seen in the Grand Canyon of the Colorado where that not very large river has cut a gorge miles in width and thousands of feet in depth.

More important for our purpose, however, is the carrying power of running water. The carrying power of water varies greatly, varying with both the velocity and volume. Streams are capable of moving all kinds of materials from the finest clay particles to boulders weighing many tons. Not only has running water a transporting power but also exerts a sorting action. It has been demonstrated that the carrying power of a stream varies as the sixth power of its velocity. Thus if a stream having a given velocity is just capable of moving a stone weighing one pound and then the velocity should be doubled, it would be able to move stones not weighing two pounds but sixty-four pounds. It is seen from this that any slight increase or decrease in the velocity of a stream makes a very great difference in its carrying power. Since clay particles are usually very fine, they can be carried by rather slow flowing streams and hence are carried farther than the coarser materials and deposited by themselves, forming beds of more or less pure clay. Most of our heavy deposits of clay, especially those of wide range such as our shales, were laid down either in the sea or some large inland body of water. This sorting action of running water is of extreme importance and by this means large beds of sediment of nearly the same degree of fineness are laid down, giving deposits of gravel, sand, clay, etc.

Because the loose material is carried away by the water, other destructive agencies are given a much better opportunity to get at the rocks and to bring about further and more rapid decay. All rocks, no matter how compact and dense they may seem, are porous and capable of absorbing water, the amount taken in varying from a small fraction of 1 per cent to 35 or 40 per cent. It is well known, also, that all rocks are more or less full of minute cracks

so that when the water falls on the surface it sinks into these pores and cracks in many cases completely saturating the rock. As water freezes it expands about 1-11 of its volume and in this way tends to pry the particles of rock apart. Many repeated freezings enlarge the cracks until finally large and small pieces are broken off which in turn are broken still finer by similar and other actions. Much of the rock thus broken up is carried away by running water and much of it ground very fine, adding to the sum total of our clay deposits.

Moving frozen water in the form of glaciers has also given rise to large amounts of clay. Most of us are aware of the fact that, during what is known as the glacial period, a large ice cap was formed over the northern portion of Northern America. This cap, which was formed by the unmelted portion of snow left over summer for a long succession of years, probably in many places reached thousands of feet in thickness. As the accumulation went on, the lower portions were pressed outward and the southern border began to move southward. The ice, acting like a very stiff but still plastic substance, gathered up practically all of the loose material over which it passed, ground the smaller and softer rocks to an impalpable powder, rounded the larger masses into boulders, scraped, scoured and wore down the rock masses over which it passed, and carried all of this loose material with it southward, some of it for hundreds of miles, and some of it for only short distances. In moving southward, the southern edge of the ice finally reached a region warm enough to completely melt the gradually thinning sheet. Of course, with the final melting of the ice, all material being carried by it was dropped. At the edge were built up long ridges or rounded hills, forming what are known as glacial moraines. With the final retreat of the edge of the ice sheet northward, pausing now and then as it did to form moraines, there was laid down a continuous sheet of debris varying from just a few feet to hundreds of feet in thickness. In front of the edge of the melting ice, many lakes were formed with many streams flowing into them. These streams were constantly loaded with the finer sediment, and by means of the sorting action spoken of above, many deposits of nearly pure clay were formed. Large quantities of the finer materials, more or less mixed with pebbles, boulders, etc., left in the drift sheet, form our surface clays and are found serviceable for common brick and tile.

Added to the force of freezing and frozen water is the change of temperature from day to night. In some regions this change is slight but in others it is considerable. During the day while the sun is shining on the bare surfaces of the rocks a thin layer on the outside becomes highly heated, while, because of the poor conductivity of stone, the layer beneath remains at about its original temperature. The expansion of the outer, heated layer sets up strains between this layer and the interior causing chips sometimes weighing as much as 200 pounds to split off. This breaking up leaves the stone in shape to be more readily attacked by other agencies.

The materials broken down in various ways are frequently covered by growing vegetation whose roots are pushed downward into the soil. The roots are capable of taking certain things from the soil for the use of the plants, thus further breaking up the rock fragments, working it over and adding organic matter which exerts a further chemical action as mentioned later.

The rocks giving rise to the great mass of our clays are made up of a number of individual minerals. It is the breaking down of these minerals within the rock mass that produces the clay. The more the mass of rock is broken up so the weathering agencies can get at the separate minerals, the more rapidly does decay go on to the production of kaolin. The common minerals which by their decay produce kaolin are the aluminum silicates, feldspars. Other minerals producing kaolin, but not so abundantly because they are themselves less plentiful, are mica, nepheline, lucite, andalusite, cyanite, epidote, scapolite, sillimanite, sodalite, topaz and zoisite. The breaking down of these individual minerals into clay is brought about largely by chemical action.

Water, as it is evaporated from the surfaces of oceans, lakes,

ivers, etc., is practically pure, but as this moisture comes in contact with the gases of the atmosphere, is condensed and falls to the earth again, it is no longer pure but holds dissolved in it small quantities of oxygen, nitrogen, carbonic acid and other gases. There is, then, no such thing as pure water at work on the rocks of the earth's crust. The main chemical forces at work in producing clay, then, are water solutions and gases. The results produced are mainly those of oxidation, reduction, hydration, carbonation and solution.

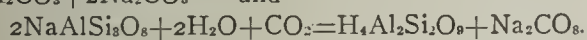
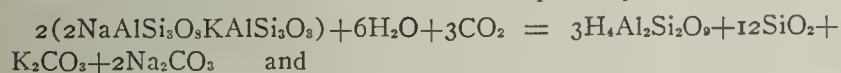
Whenever moisture falls to the surface of the earth, whether in the form of rain or snow, it carries with it considerable quantities of oxygen. Some of this gas is carried downward into the rocks with the water as it soaks in, and again, if the rocks are not completely filled with water, oxygen penetrates as a gas, also, so that there is always more or less oxygen coming in contact with the materials below the surface. If the oxygen comes in contact with organic matter, the latter is oxidized, producing among other things humic acid, carbonic acid and water. Both of these acids are active and produce further action as mentioned later. Oxygen coming in contact with inorganic compounds changes many of the protoxides to sesquioxides. The only one that is of any practical value for our purpose, however, is the change from the ferrous to the ferric form of the iron in the rock forming minerals. Because of the great affinity of iron for oxygen, the coming of solutions containing oxygen or the moist gas itself in contact with minerals having ferrous iron in their compositions, causes a chemical change to take place in many minerals. In the case of the silicates from which kaolin is produced, at the same time the iron is oxidized, hydration and carbonation usually take place, bringing about a more complete decomposition of the mineral. Probably the chemical reaction of widest extent going on in the rocks near the surface is that of hydration. Hydration is the union of water with chemical compounds such as minerals. Its effect is to increase the volume of the mineral and at the same time make it more susceptible to other alterations. Carbonation, as already mentioned, is the union of carbonic acid with bases, producing carbonates. Silicic acid, in spite of its great chemical activity at high temperatures, is the weakest of acids at ordinary temperatures, so that the silicates are readily broken down by carbonic acid which unites with some of the bases and results in the production of a new series of minerals.

Perhaps the best way to illustrate the effects of these chemical changes is to give the reactions that are supposed to take place in the breaking down of the common feldspars into kaolinite, which, of course, is the basis of all our clays. According to Van Hise they are as follows:



In this reaction Orthoclase feldspar, KAlSi_3O_8 , is acted upon by water, H_2O , and carbon dioxide, CO_2 , probably held in solution in the water and produces kaolin, $\text{H}_4\text{Al}_2\text{Si}_2\text{O}_8$, fine silica, SiO_2 , and carbonate of potash, K_2CO_3 . The K_2CO_3 , being soluble in water, is probably carried away in solution, leaving the kaolinite and silica as a residue.

For Anorthoclase, $2\text{NaAlSi}_3\text{O}_8$, KAlSi_3O_8 , AlSi_3O_8 , and Albite $\text{NaAlSi}_3\text{O}_8$, the reactions are almost the same and are probably as follows:



In the case of Anorthite, $\text{CaAl}_2\text{Si}_2\text{O}_8$, there are several reactions producing kaolinite as one of the resulting minerals. Two of these reactions are as follows:

1st. $4\text{CaAl}_2\text{Si}_2\text{O}_8 + 3\text{H}_2\text{O} = \text{H}_4\text{Al}_2\text{Si}_2\text{O}_8 + \text{H}_2\text{Ca}_4\text{Al}_6\text{Si}_6\text{O}_{28}$, in which the resulting minerals are kaolinite and zoisite, $\text{H}_2\text{Ca}_4\text{Al}_6\text{Si}_6\text{O}_{28}$, and

2nd. $4\text{CaAl}_2\text{Si}_2\text{O}_8 + \text{Fe}_2\text{O}_3 + 6\text{H}_2\text{O} = \text{H}_4\text{Al}_2\text{Si}_2\text{O}_8 + \text{H}_2\text{Ca}_4\text{Al}_4\text{Fe}_2\text{Si}_6\text{O}_{28} + 2\text{Al}(\text{OH})_3$. In the second of these reactions besides the kaolin we have formed Epidote, $\text{H}_2\text{Ca}_4\text{Al}_4\text{Fe}_2\text{Si}_6\text{O}_{28}$, and Gibbsite, $\text{Al}(\text{OH})_3$.

Both Zoisite and Epidote are themselves capable of breaking down into kaolin, calcite, sand, etc. Probably enough has been said to show in a general way how clay deposits are produced from crystalline rock and why the clays thus produced are frequently so impure.

Thus far little has been said of solvent power of water and water solutions on rocks and minerals. If we were to make an analysis of a sample of water from almost any well or spring we should find in it one or more of the common bases or acids such as lime, iron, magnesia, soda, potash, carbon dioxide, hydro-sulphuric acid, etc. Small amounts of these substances may have been carried into the ground by the water as it fell as rain, but by far the greater amount came from the rocks themselves by the dissolving action of the water; in fact, we know that all minerals of whatever kind are readily dissolved by the ground water passing over and through them. While this action is of considerable importance in the production of clays from crystalline rocks, it is of much greater importance in its action on limestones and in purifying clays already formed. We know from our analyses of limestones that many of them contain clay in their make-up. We also know that they are all laid down in more or less distinct layers and are broken into blocks of variable sizes by vertical jointing cracks. Water carrying carbon dioxide, CO_2 , in solution, readily finds its way through these stones by means of these cracks and bedding planes and exerts a strong dissolving action on the carbonate of lime, CaCO_3 , of the stone. Carbon dioxide acting on the limestone produces the soluble bicarbonate, $\text{CaCO}_3 + \text{CO}_2 = \text{Ca}(\text{CO}_3)_2$, which is carried away in solution. As this action continues, the calcium carbonate of the limestone is finally all or nearly all carried away and the clay impurity concentrated until we often have a bed of very pure clay remaining. Some of our finest deposits of kaolin and fire clays are produced in this way. The action of water and water solutions containing acids from decaying organic matter and from the atmosphere frequently make considerable changes in the character of the clay even after the deposit is finally formed. Many impurities may be removed, others added, or those present gathered together. The gathering together of the iron into nodules of the oxide or sulphide (sulphur rock), the formation of deposits of calcite and gypsum, or the cementing of the clay into a more or less compact mass are due to this action of solution and deposition.

Finally, then, our clays are divided into two general groups: Those formed in the place in which they are now found, residual clays, and those that have been transported by water, wind, or ice from the place of origin. All of them, however, have come from the destruction of crystalline or fragmental rocks by chemical, mechanical or combined chemical and mechanical forces.

The evening twilight having made it possible to darken the Auditorium, the stereopticon was introduced, to illustrate by pictures on a screen "The Esthetic Possibilities in the Use of Clay Products in Architecture," by Dean J. M. White, College of Engineering, University of Illinois, Champaign.

Dean White's paper will appear in next issue.

Dr. Converse: I am sure that everyone present has so realized and appreciated the novelty and interest of the lecture that they will all concur in a vote of thanks to Dean J. M. White, of the University. (Applause.)

A motion was submitted, duly seconded, and carried unanimously.

The final event in the third session was a lecture by Mr. S. S. Wyer of Columbus, Ohio, upon the Composition, Manufacture and Use of Producer Gas, illustrated by a series of 30 stereopticon views of the different types of apparatus employed in the manufacture of fuel gas and its application to various industries, particularly having reference to its use in the kilns.

This paper will appear in a future issue of the CLAY RECORD. Mr. Wyer was greeted with hearty applause from the audience which listened attentively for one hour and five minutes at the end of which the session was adjourned to meet Thursday morning.

A NEW BRICK INDUSTRY FOR BRITISH COLUMBIA.

Before very long Clayburn (B. C.) will be a name to conjure with, and one of the most important industries in British Columbia will be located there. Clayburn is in Matsqui municipality, about five miles from Mission City, on the Mission branch of the C. P. R., and it owes its existence to the discovery of one of the finest clay deposits in America, and to the further fact that there is a large and growing demand for the products manufacturable from clay. En passant, it may be mentioned, that the value of the clay products of the United States is each year greater than the production of gold.

For paving brick alone the demand is practically unlimited, and much less of it has been used in the past than would have been in this province owing to the cost of transportation.

Vancouver has used some and it has given great satisfaction. When the works at Clayburn are started the objectionable feature of heavy initial cost will be eliminated.

A recent canvass made of 32 cities of the United States showed that 44 per cent. of pavement in contemplation was to be of brick. When the proper machinery is installed at Clayburn, as it will be within 60 days, brick can be made as durable as granite and as hard as tempered steel.

Thorough tests have been made of the Clayburn clay deposit to determine the plasticity, water to make a plastic paste, shrinkage in drying, shrinkage in burning, speed in drying, speed in burning, point of incipient vitrification, point of complete vitrification, point of viscous vitrification, density before and after burning, colors of the burned ware, and strength of the burned ware.

In regard to all these points the Clayburn clay has been shown to rank A1.

The plasticity is pre-eminently the first question in any clay, as on this property depends the ability to mold the ware. If too lean to be readily or safely molded, it requires admixture with a "fat," or plastic, or "bond" clay, while if too "fat" or plastic it needs reducing with sand, "grog," or a lean clay. The plasticity is of special importance in paving brick, as if too plastic the laminations, which have a weakening effect on the brick, are excessively developed. As regards plasticity experts have declared that the Clayburn deposit has few if any equals.

The Clayburn deposit is to be developed by Vancouver capital and British Columbia enterprise. The discovery was made by the Maclure brothers, and they having shown what a good thing they had, the necessary capital was easily secured. The developing company is known as the Vancouver Fire Clay Co., Ltd., with works at Clayburn and registered head office at 151 Alexander street, Vancouver, B. C. Mr. Alex. Morrison is president, Mr. W. H. Armstrong vice-president, Mr. J. C. Maclure, secretary, the two others directors being Mr. Robert Armstrong and Mr. F. S. Maclure. The other leading shareholders are Mrs. S. A. McLagan, Mr. John Maclure and Mr. D. R. Morrison.

The company has secured 1,000 acres of fire clay, coal and timber lands, and is now completing arrangements for the establishment of a factory for the production of finest high-grade fire brick, the various colors of dry pressed brick.

The company has a five-mile right of way from the C. P. R. track to the clay deposits. This will be utilized to bring the clay from the deposits to the works at Clayburn and to ship the finished products. The company has already installed a connecting switch with the C. P. R.

The superintendent is Mr. H. B. Harmon, who has had many years' experience with clay-working plants and in handling clay-working machinery.

In the past Vancouver has had to import everything in this line or else use "mud" brick. It will not be necessary to go out of the province in future for this class of goods.

The company has provided against competition in its own locality. Its motto is to be "good bricks cheap," and the better the market the cheaper the goods can be supplied.

The company has water power three-quarters of a mile above the townsite of Clayburn. There is enough power to run the works and run cars in and furnish light for the village.

The manufactory buildings will be about a mile and a quarter from the C. P. R. track. The work site covers 20 acres. The main factory will be about 150x175 feet, with a large tower 50 feet high in the center. In this tower the clay will be elevated and screened and conveyed to the presses by belt transmitters. Auger machines will be used for converting it into paving brick and dry press machines for front or face brick and brick of every shape and color. In the molding room will be the necessary apparatus for the making of locomotive blocks and every style and dimensions of fire brick. There will also be the necessary apparatus for turning out drain tile of all classes, also vitrified sewer pipe. The product will go from the main buildings to the dry kiln by automatic conveyors. This section will be 150 feet long by 50 feet wide. There will also be seven round down-draught kilns. From the time the crude clay arrives at the bins it will be handled automatically. It will be brought from the clay workings in the company's own cars, hauled over the company's own road by the company's own locomotive.

The track from the mine to the works will be narrow gauge, and from the works to the C. P. R. tracks standard gauge, but a third rail will be provided so that the narrow gauge engine will be able to move the standard gauge cars to and fro between the works and the C. P. R. track.

An analysis of the company's clay was made by Prof. Orton.

As soon as the works are started the company will employ 150 men, and this staff will be increased as the demand grows.

The company has now on the way machinery from the American Clay Machinery Co., at Bucyrus, Ohio.

Few companies have a brighter future than the Vancouver Fire Clay Co., Ltd. They have the material to make a first-class article and they have a market waiting for them.

Mr. J. C. Maclure is entitled to great credit in prospecting these extraordinary deposits, establishing their value by satisfactory tests and forming the present strong company.

EXTENSIVE PROGRAMME ARRANGED BY ILLINOIS STATE GEOLOGICAL SURVEY.

The state geological commission has completed the corps and arranged for the season's work. The following appointments were made to the regular force and in addition the director was authorized to make such temporary appointments as might be necessary, subject to confirmation at a succeeding meeting of the commission:

Professor C. W. Rolfe of the state university, consulting geologist in clay work.

Professor R. D. Salisbury of the University of Chicago, consulting geologist in charge of educational work.

Dr. U. S. Grant of Northwestern university, consulting geologist in lead and zinc work.

Professor S. W. Parr of the state university, consulting chemist in coal work.

Dr. Edward Bartow, director of state water survey, consulting chemist in water work.

F. B. Van Horn, recently of the Missouri geological survey, assistant geologist.

F. F. Grout, recently of the West Virginia geological survey, assistant chemist.

H. B. Fox, of the state university, assistant geologist.

J. A. Udden, professor in Augustana College, geologist.

W. W. Atwood of Chicago university, geologist.

Dr. Stuart Weller of Chicago university, geologist.

Ross C. Purdy of the State School of Ceramics, ceramist.

Not all of the men appointed will be able to devote their full time to the survey work, but assurances have been received that all will give some time to it. Professor Rolfe and Mr. Purdy, assisted by Dr. Fox, will devote particular attention to the clay resources of the state, beginning their work probably with a study of paving brick and the clays used in their manufacture.

Professor Parr, Mr. Grout, Mr. Van Horn and the director of the survey, Mr. Bain, will devote their time largely to a study of the coal fields. It is proposed to take samples of the various seams and to study their qualities as well as their distribution in the field. In the latter work Dr. Weller and Mr. Atwood will assist.

Professor Udden will devote his time to a study of the underground waters of the state with a view to the determination of the limits of the various artesian basins and the depth to which it is necessary to go to obtain good water for municipal and other purposes. In this work he will be assisted by Dr. Bartow and the state water survey, which will make the necessary analyses and laboratory tests.

Dr. Grant, with such assistance as may be necessary, will take up the study of the lead and zinc fields found near Galena, continuing the work done by the state of Wisconsin.

Professor Salisbury, assisted by various others yet to be appointed, will prepare a series of bulletins for use in the schools, descriptive of the geography and geology of important type localities within the state. So far arrangements have been made for such bulletins covering the lake shore from Evanston north, the Illinois valley near Peoria and the Mississippi valley between Savanna and Rock Island, and at East St. Louis. The first of these bulletins is now being prepared by Mr. Goldthwaite of Northwestern university.

BRICK PLANT FOR HOBOKEN.

A. A. Gery, president of the United States Brick Company, Reading, Pa., has consummated a deal whereby the Seaboard Brick Company, of New York, one of the subsidiary companies of the first named corporation, will erect within six miles of Hoboken, N. J., a brick plant costing \$1,500,000.

The plant will be located along the Hackensack river, the company having purchased 700 acres of land for a site. It will have a capacity of 150,000,000 of brick annually, to be sold exclusively in the New York market. Building operations will be commenced in the early spring and the work completed as rapidly as possible. When completed the plant will give employment to 400 people.

CLAY PIGEON PLANT FOR SOUTH OMAHA.

Dana Morrill, one of the best-known sportsmen of the west, will, about April 1, establish in South Omaha, Nebr., an industry for the manufacture of clay pigeons, millions of which are used every year by the shotgun experts of the United States.

Mr. Morrill is now installing the machinery for his new factory and expects to employ a number of men in the running of his plant. The plant will be located at 313 North Twenty-Fourth street, South Omaha.

"I expect to have my factory running in about two months," said Mr. Morrill. "I have a portion of the machinery on the ground and will have the balance in the course of a few weeks."

Mr. Morrill has a large trade on loaded shells for field and trap work for the shotgun men.

There are only three factories of any prominence in the United States where clay pigeons are manufactured. These are located at Kansas City, St. Louis and Cleveland, O. The output of the three plants is about 30,000,000 targets each year. Mr. Morrill expects to put at least 7,000,000 targets on the market the present year and gradually increase his trade.

The "White Flier" and the "Dickey Bird" targets are now the most used of any manufactured. The first is made from a composition of ground limestone and pitch and the latter of clay and pitch.

Clay and pitch can be obtained in abundance in the vicinity of Omaha and Mr. Morrill expects to be able to manufacture the inanimate birds at a less cost than is done elsewhere.

DENNY-RENTON COMPANY PLAN EXPENDITURE OF \$150,000.

The Denny-Renton Clay Company, Seattle, Wash., is planning large addition to its plant there. Already there is an output of \$20,000, which is being spent to put in a new drying plant. The heat for this drying plant comes in pipes from the dry kilns in which the brick is being burned.

The new vein of coal which is on the property of the company here is proving to be large enough to supply the company with all the coal it uses at its factory here and also at the factory in Van Asselt.

BENTONITE OF THE LARAMIE BASIN.

Mr. C. E. Siebenthal of the United States Geological Survey spent part of last summer in the Laramie Basin, Wyoming, where he made some interesting observations concerning the variety of clay known as bentonite, which occurs in many localities in that state. When freshly exposed, it varies in color from a light yellow to a light olive green with a waxy luster. On exposure it assumes a dull cream color. In freshly uncovered outcrops it appears as a bedded joint clay, the blocks varying from roughly rectangular or conchoidal shape to long, slender pieces. The joints are more or less open and occasionally contain crystals and plates of gypsum and sulphate of soda. In texture the clay is very fine grained. It develops no grit to the touch and very little when ground between the teeth. The microscope shows that it is made up of extremely minute, more or less rounded particles of fairly uniform size and apparently of the same mineral nature, with here and there particles of undecomposed labradorite. The clay has a soft, unctuous, or soapy feeling, but it is brittle and is easily quarried. It clings strongly to the tongue. In weathering it absorbs a great amount of water and increases much in volume, forming a network mantle an inch thick, but later melting down, under the effects of rainfall and frost, to a white powder. Mixed with the proper amount of water it is exceedingly plastic, and with the addition of more water becomes a perfect paste. Tests show that it completely absorbs over three times its weight, or seven times its volume, of water and twice as much glycerine as diatomaceous earth will absorb.

The chief use of the clay so far developed is as a material to give body and weight in the manufacture of paper. Practically the whole output of the clay for the last few years has been taken by a paper mill in Denver. It is also used in the manufacture of "antiphlogistine," a proprietary remedial dressing, and as an adulterant in the manufacture of candies and drugs. Its first use was as a material for hoof-packing, a dressing or poultice for the inflamed hoofs of horses. Though highly plastic, it is unsuitable, on account of its fusibility, for the manufacture of fire clay products. If mixed with ground felspar, it could possibly be used in the manufacture of pottery. It is a good retarder for use with the hard cement plasters. Its high absorption of glycerine, as compared with diatomaceous earth, suggests its substitution for that material in the manufacture of dynamite.

After discussing the geologic occurrences of the bentonite beds, Mr. Siebenthal describes briefly the deposits found at Taylor's pit, Linscott's pit, on the claim of the Cassa Mining Company, on Sam White's claim, and on Cosgriff's. These are the only occurrences of this clay which have assumed commercial importance in the Rock River region, the type locality for the clay. They are strung along the outcrop of the Benton formation for a distance of 20 miles. The bed of clay is probably persistent throughout that distance, though its outcrop is not always apparent.

Bentonite has been noted at a few other localities in the

Laramie Basin, along Hutton Lake, on Sand Creek, and on the Riverside ranch.

From 1888 to 1895, inclusive, the production of bentonite averaged about 60 tons annually. From that time it gradually increased until, in 1902, it is reported to have been 1200 tons. With the closing down of the western paper mills the production almost stopped and in 1905 the amount shipped was very small. From 1888 to 1895 the price averaged \$25 a ton, f. o. b. cars. The price then dropped to \$5 a ton, later rising to \$6 and \$7 a ton. The total production to date is approximately 6000 tons, with a value of \$45,000.

CONDITION OF THE CLAY TRADE ABOUT PITTSBURG.
Pottery Ware.

A canvass of the potteries in Eastern Ohio and Western Pennsylvania results in very favorable opinions regarding 1906, a number claiming that prospects were never better. A majority of the plants are running full time and the demand at present and during the year was much better than 1904, with prices about 10 per cent higher and still showing an upward tendency. The labor situation is peaceful, the associated potteries having arranged with the workers' organization as to wages for the next two years. Production is larger than last year and conditions generally are satisfactory. Collections have been good during the greater part of the year.

Red Brick.

The red brick industry shows considerable improvement over last year, which was expected, as the year opened with a very favorable building outlook. During 1904 the demand was not good and plants did not run better than 60 to 70 per cent of their capacity, while at present plants are running full time and have done so nearly the whole year. There is a good demand and as there is considerable business in sight for next year prospects are exceedingly encouraging. The Pittsburgh association represents 27 plants, with a yearly output of 125,000,000 bricks, three-fifths of which are used in the immediate vicinity and the balance of 75,000,000 are shipped to other markets. In Allegheny county there are about 41 plants, employing on an average of 40 men to a plant. Common red brick is quoted at \$6.25 to \$7 per 1,000, as compared with \$5.75 to \$6 at this time last year and \$6.50 to \$7 in 1903. Collections during the year have been slow, a condition that seems to have affected nearly all building materials.

Fire Brick.

The demand for fire brick was stronger than in 1904. During the year the iron and steel market has been brisk and consequently the demand for fire brick has been very good. The normal capacity of the fire-brick plants of the entire country is estimated at between five and ten million bricks of all grades per day. During 1904 production was not better than 50 per cent, while at present the majority of the plants are running close to full time. General conditions surrounding the trade are good and prospects for 1906 are most encouraging. Prices are much better, but collections during the greater part of the year were slow.

EIGHTEEN SUITS AGAINST ESTATE BY INVESTORS IN BRICK WORKS.

Startling charges are made in suits brought against Jennie C. Ferris and J. Irving Dibble, of Norwalk, Conn., executors of the will of John N. Ferris, of that town, to recover damages aggregating \$55,000. There are eighteen distinct suits, and the papers were served today by Deputy Sheriff Hendrie of Stamford. Michael Kenealy, chairman of the Republican State Central Committee, and John F. Kealing, are counsel for the plaintiffs. The charges concern John N. Ferris, of Norwalk, who died April 10, 1904, leaving a large estate. Mr. Ferris was president of the First National Bank of South Norwalk, a state senator, and in public and private life was considered a man of sterling character.

It is charged that in September, 1902, he induced the plaintiffs, who were personal friends, to purchase preferred stock of the W. A. Underhill Brick Company, engaged in making and selling bricks and selling agricultural products from certain real estate owned at Croton Point, N. Y., telling them that the stock was as safe as government bonds, that the manufacturing plant alone was worth more than the company's outstanding obligations, that the business was prosperous and the company was paying dividends of 7 per cent a year on the preferred stock and was likely to pay larger dividends.

The plaintiffs further allege that Mr. Ferris, knowing the contrary to be true, deliberately misrepresented the situation to them with intent to sell the stock and defraud them; that the brick company was financially embarrassed, the stock they bought worthless, and that the issue of the stock in question was not to make improvements to the plant, but to raise money to meet outstanding obligations other than the mortgage for \$175,000, and enable the company to declare fraudulent dividends.

The plaintiffs say they did not know a thing about the company save what Ferris told them, and that it was on his advice solely they made the investment. The plaintiffs presented claims against Mr. Ferris's estate, but the executors disallowed them, hence the suit. The plaintiffs and the amounts for which they sue are as follows: Oscar St. John, \$1,000; Susan Watkins, \$1,000; Samuel Grumann, \$2,000; E. N. Sipperly, \$3,000; William Comstock, \$2,000; Thomas S. Osborn, \$3,000; Albert Davis, \$4,000; Albert S. Comstock, \$9,000; Josephine Stilson, \$2,000; G. N. Goodrich, \$2,000; Henry Seymour, \$2,000; Adelaide N. Sipperly, \$4,000; William F. Aston, \$3,000; John H. Knapp, \$2,000; George W. Carroll, \$3,000; Fred W. Aunton, of Darien, Conn., \$6,500; Grace E. Osborn, \$3,000, and Edward Lowder, \$2,000. All the plaintiffs save Mr. Aunton are Norwalk people, and all in moderate circumstances.

DINAS BRICK COME FROM WALES

Dinas bricks are made from a peculiar kind of rock found at Dinas in Wales. They contain 98 per cent silica with a little alumina. On account of their refractoriness or infusibility the bricks are much used throughout Great Britain.

CAMP HAS A PATENT FOR A DRYER.

H. B. Camp, Akron, O., has been issued patent rights on a patent drier which promises to revolutionize the sewer pipe and clay drying process. Mr. Camp has not installed his new drying process in any factory as yet but in his new factory, which is now under construction in Cleveland, he expects to install his new process, where it will be given a thorough test. The drier takes the product from the press automatically, dries it and passes it to the kiln door. This system does away with the handling of the product and considerably lessens the use of labor required by the old way.

WISCONSIN CLAYWORKERS' ASSN. MEETING

The sixth annual convention of the Wisconsin Clayworkers' association will be held in Menomonie, Wis., March 9th and 10th. A very interesting and instructive program is being prepared of which the following are some of the subjects: "The use of waste heat from common up-draft kilns for drying brick, vs. open air drying." "Brick vs. Concrete." "The test of Wisconsin bricks." "What constitutes a modern brick plant." "The benefits of organization." "How to overcome the difficulties that arise in the manufacture of brick." "Tile drainage in Wisconsin," and "Different methods of burning brick, and the practicability of each." Aside from the program, the forenoon of one day will be devoted to a trip to the brickyards. The plant of the Hydraulic Pressed Brick Co. will be in full operation and since this plant is one of the largest and best equipped in the state, this will be a most interesting and profitable adjunct to the program.

Some matters of vital importance are to be brought up before the convention, chief of which perhaps is the rate question. Chicago brick are being shipped into Wisconsin towns on a rate which is only about one-half of the published tariff, and local manufacturers are unable to compete with these brick and realize a satisfactory profit. We now have a railroad rate commission which is composed of honest men I believe, whose duty it is to regulate these matters, and if the clayworkers of the state will get together and take some united action to bring this matter before the commission, I think that they will put a stop to it.

Until some such action is taken, however, and we take a stand for our rights, we can only expect to see this state of affairs continue.

We extend to you a most cordial invitation to join with us at Menomonie, as the weight which the petition will carry before the commission, will depend largely upon the support given it by the manufacturers throughout the state.

One word about the city in which we are to meet. While most of us perhaps know of Menomonie as a city of brick yards, still it is noted to probably an equal degree in educational circles for its schools. Here is located the Stant School of Manual Training and Domestic Science, which is by far the best school of its kind in the state. A trip through this institution will doubtless be looked forward to with interest.

First-class hotel accommodations may be had at the Hotel Royal, which has been made the headquarters of the convention, while, if preferred, cheaper rates can be secured at other hotels in the next block.

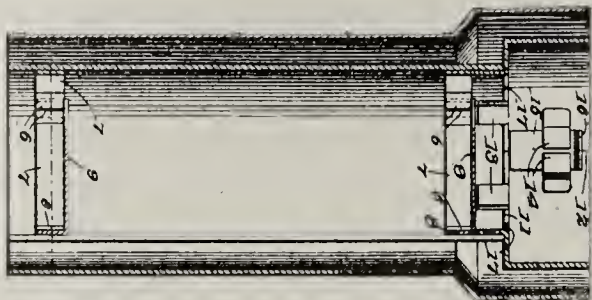
J. G. HAMILTON, Secretary.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

808,167. Mold. Edward F. Nevins, Blue Rapids, Kansas. Filed April 17, 1905. Serial No. 255,994.

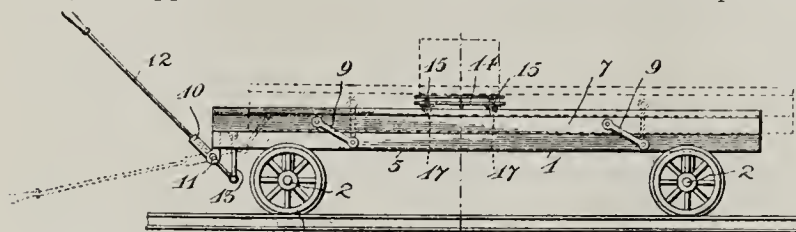
Claim—A pipe-mold comprising a tubular body having a bell terminal, a core member terminating short of the bell terminal of the body, and a core-bell member for removable



engagement with that end of the core which is adjacent the bell terminal of the body, the core-bell member capable of being contracted for withdrawing the same from a cast.

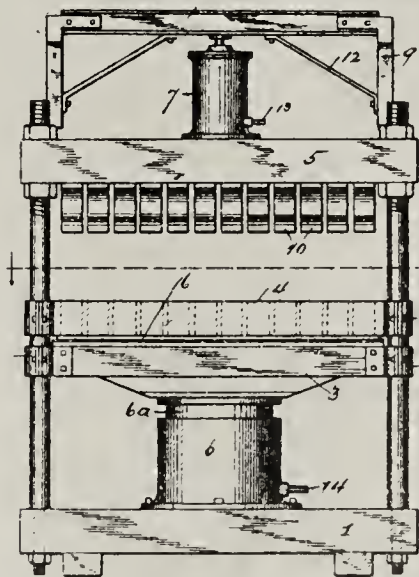
808,212. Elevating-Truck. Thomas Podmore, Wilkes-barre, Pa. Filed February 13, 1905. Serial No. 245,473.

Claim—A truck of the class described having a lower frame, an upper frame on the lower frame and adapted to



be raised and lowered, links connecting the upper and lower frames together, said links serving to support the upper frame in an elevated position, a guide member pivotally connected to the lower frame, a lever-handle mounted and slidable in said guide member, and a link connecting the lever-handle to the upper truck-frame, for the purpose set forth, substantially as described.

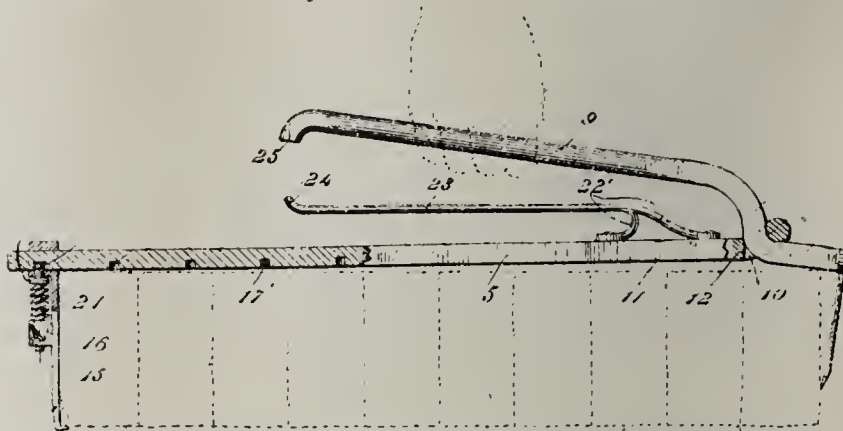
809,250. Cement-Brick Machine. Fred B. Dysart, Superior, Nebr., assignor of two-thirds to C. E. Adams and A. C. Felt, Superior, Nebr. Filed August 18, 1905.



Claim—In a machine for making blocks from material in plastic form, a bed-plate slidably mounted on a suitable frame, mold-boxes slidably mounted on said frame above said bed-plate, means for raising said bed-plate and mold-boxes, a header adjustably mounted on said frame, dies secured to the under side of said header, and means for raising said mold-boxes independently of said bedplate.

809,146. Brick-Tongs. Rasmus Skov and John Forberg, Aneta, N. D. Filed May 27, 1905. Serial No. 262,661.

Claim—A device of the class described comprising a stationary and a relatively movable clamping member, and a detachable gripping-jaw mounted for longitudinal adjustment on said stationary member.

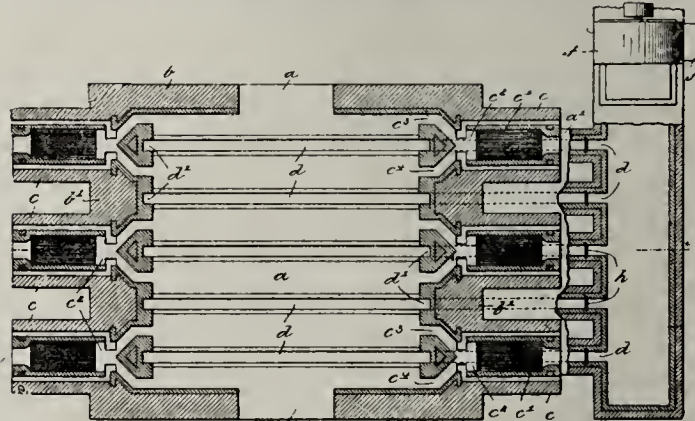


809,225. Process of Manufacturing Artificial Paving-Stones. Wilhelm Schumacher, Oberdollendorf, Germany. Filed Dec. 11, 1903. Serial No. 184,842.

Claim—The herein-described method of producing artificial paving-stones, which consists in first heating bauxite at a high temperature until it is perfectly sintered, then reducing it to small pieces of a suitable fineness, next mixing it with a ground binding material (clay, cement, asphalt and the like), afterward moistening the mixture with water and molding it to stones and finally burning the stones.

The herein-described method of producing artificial paving-stones, which consists in first heating bauxite with the addition of a flux at a high temperature until it is perfectly sintered, then reducing it to small pieces of a suitable fineness, next mixing it with a ground binding material (clay, cement, asphalt and the like), afterward moistening the mixture with water and molding it to stones and finally burning the stones.

808,847. Updraft-Kiln. Edwin A. King, Philadelphia, Pa. Filed June 5, 1905. Serial No. 263,790.

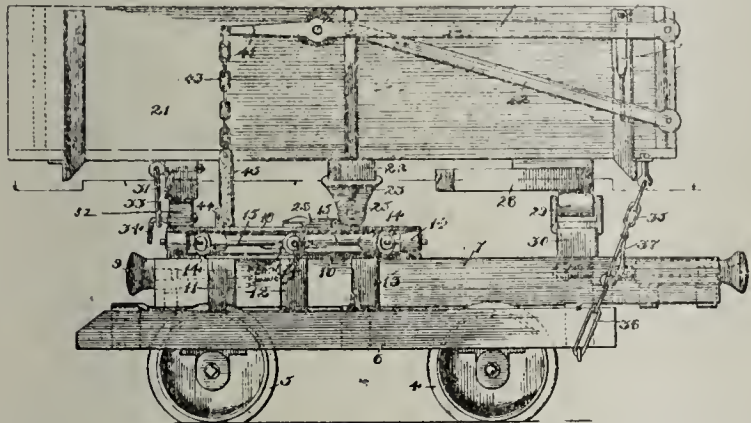


Claim—An updraft-kiln having a floor or kiln-seat, a series of flues arranged therein, said flues arranged below and opposite the benches of brick placed in said kiln and terminating at the level of the floor so as to be formed by the floor and to be covered at their upper ends by the brick placed on the floor.

An updraft-kiln having a floor or kiln-seat, a series of flues arranged therein, said flues arranged below and opposite the benches and intermediate of the arches of brick placed therein and terminating in the walls of said kiln, flues extending upwardly from said floor-flues in certain of the walls of said kiln and forming the continuation thereof, said floor-flues and their wall extensions adapted to be covered by the brick in said kiln, a damper arranged in each of said floor-flues and adapted to render the same and their wall extensions inoperative, when closing said flues, a main flue communicating with said floor-flues and their wall exten-

sions and exhaust means arranged at the end of said main flue and adapted, when actuated, to withdraw the heat of said kiln and the brick therein by said floor-flues and their wall extensions and to collect and force the same out of said main flue to a place for utilization.

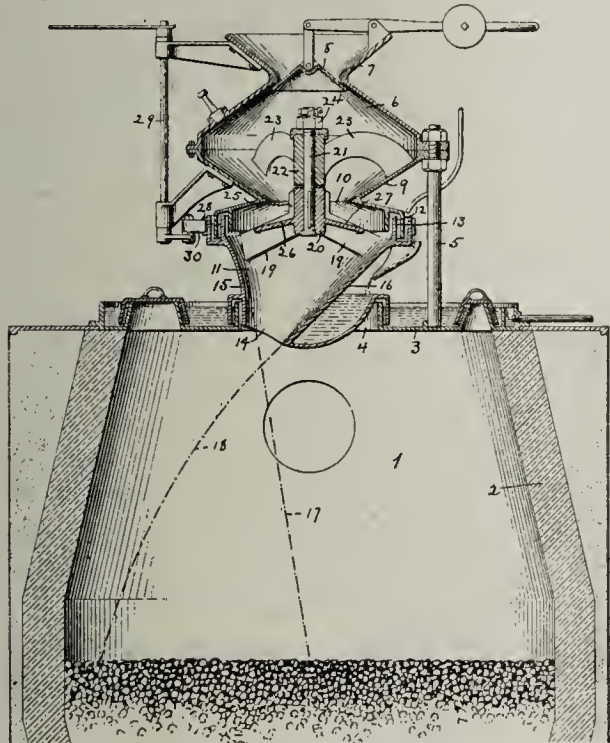
809,522. Dump-Car. Thomas R. McKnight, Aurora, Ill., assignor to Western Wheeled Scraper Company, Aurora, Ill., a Corporation of Illinois. Filed July 11, 1903.



Claim—A dump-car, consisting of a wheeled truck, a tilting car-body having an open end, an edgewise-movable gate therefor, a rotary support on which said car-body rests, and means rotating with the car-body for automatically holding up the end gate when the car-body is tilted to dump the load.

809,295. Gas-Producer. Jerome R. George, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass., a Corporation of Mass. Filed July 10, 1903.

Claim—In a gas-producer, the combination with the heating-chamber having an opening at its top for the admission of fuel, of a fuel-reservoir placed above said opening and having an opening in its bottom for the delivery of fuel to a distributor, a distributor between the opening in the heating-chamber and the opening in the reservoir,



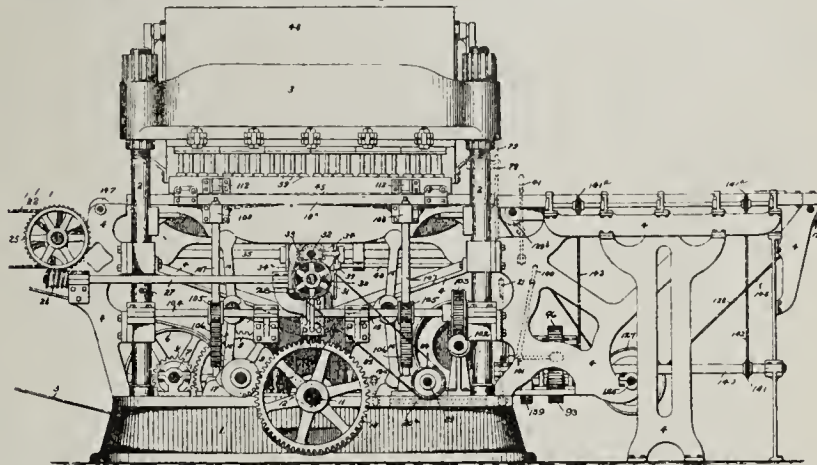
said distributor consisting of a rotating shell smaller at its lower than at its upper end, with an opening at its upper end larger than the delivery-opening of said reservoir and concentric with its axis of rotation, and with an opening at its lower end eccentric with its axis of rotation, and a disk inclosed in said distributor having its diameter larger than the diameter of the delivery-opening in said reservoir, with an annular space around said disk for the passage of fuel.

In a gas-producer, the combination with a heating-cham-

ber having an opening at its top for the admission of fuel, of a fuel-distributor above said opening and consisting of a rotating shell having a passage therethrough, with the lower end of said shell the smaller and provided with an opening eccentric to its axis of rotation, a disk carried by said shell, with its upper surface slightly inclined from its center downward, and having an annular space between said disk and the inner wall of said distributor, substantially as described.

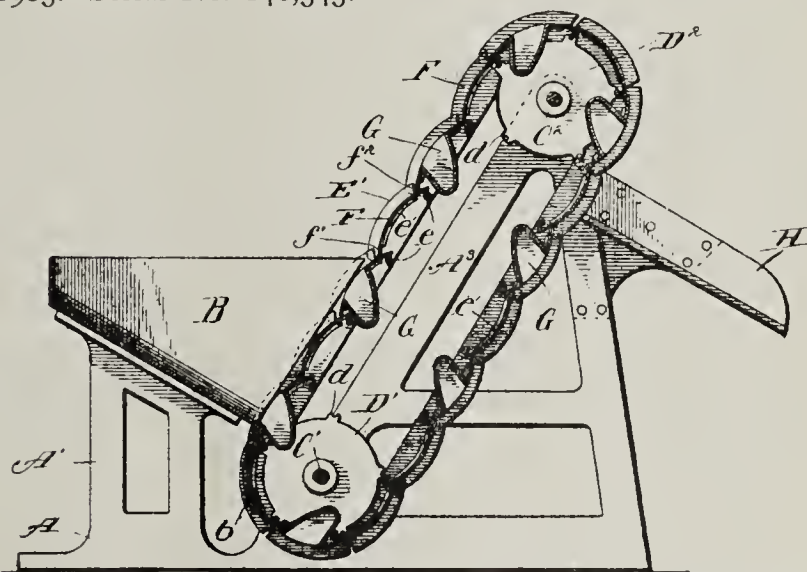
809,834. Cement-Brick Press. Horace B. Murdock, Detroit, Mich. Filed February 21, 1905. Serial No. 246,720.

Claim—In a brick-press, a mold-box, means for loosely filling said box with brick-making material, means for tamping said loose material, means for refilling said box, and means for pressing the fresh and tamped material into a finished brick, substantially as described.



In a brick-press, a pressing-punch and a table thereunder, means for placing a filled mold-box with its palette on said table, means for bringing said table and punch together to press the brick, means for stripping the box from the finished brick, and means controlled by said actuating means for bringing forward a new palette, for placing the mold-box thereon, and for placing a second new palette in proper position to be brought forward at the proper time, substantially as described.

809,316. Conveyer. John W. Mackin, Chicago, Ill., assignor to Chester T. Drake, Chicago, Ill. Filed Jan. 24, 1903. Serial No. 140,343.



Claim—The combination with a supporting-frame, of guide-wheels journaled at the top and bottom of said frame and located out of vertical alinement, an endless conveyer passing around said wheels and comprising buckets and intermediate plates having overlapping adjacent edges, the tops of the buckets being flush with the surface of intermediate plates, a supply-hopper the lower edge of which terminates adjacent to said conveyer and lies below the axis of the lower guide-wheels, and a chute supported by said frame and located beneath the upper guide-wheel.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII. FEBRUARY 28, 1906. No. 4

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

CONVENTIONS.

The sixth annual meeting of the Wisconsin Clay Workers' Association will be held at Menominee, March 9, and 10, 1906.

Subscribe now for THE CLAY RECORD. Twent-four numbers for one dollar.

When the truth becomes fashionable, what will become of the gossips?

Don't follow the other fellow, for he sometimes will swerve the course, and if you follow close behind him will wobble and make it worse.

Many a man in a good position forgets to push—he simply hangs on. It costs less to hang on than to push, but you can't get the same money out of it unless you cheat somebody.

THE CLAY RECORD is the only semi-monthly in America published in this field. A recent advertiser said, "Your ad was too good. I sold my machine at once." Are you an advertiser? If not, why not? "The proof of the pudding is in the eating."

There will be found in this issue the papers to which we here call the reader's attention, that he may not overlook them, for if he does he will miss some of the gems in the

way of papers read at the recent Illinois Clay Workers' Association convention.

Dr. A. L. Converse, of Springfield, Ill., paper on the question, "Is the running of a brick machine to its full capacity injurious to the brick?" although brief, was much to the point and elicited much discussion. We are inclined to the opinion that the average brick manufacturer does not appreciate this matter fully, yet it impresses us as being an exceedingly important one, and think if he put it in this shape to himself:

"I can run my machines at certain speeds and obtain economical results. What are those speeds?" and, informing himself, act accordingly, the importance will be at once seen; besides the same principle applies throughout the plant, and he will profit thereby. The same subject was subsequently discussed at the Philadelphia convention.

Martin W. Lauer, Chicago, had for the subject of his paper, "The Clay Building Block Industry: Its Death and Resurrection." The fortunes of this particular branch of clay working have been varied, and his diagnosis of the case was as complete as it was interesting. "As long as there is life, there is hope," and when there are the brave spirits as revealed in the recital of the history given in this way, one is almost constrained to exclaim, "That nothing is impossible." The reader will find the "Resurrection" which is "Life," as described by Mr. Lauer, intensely instructive. The discussion following plainly indicated the satisfaction given to the members by its recital.

The "Sewer Pipe Manufacturer's Troubles," a subject presented by A. W. Gates, Monmouth, Ill., was not treated as we might think it would be, on the first reading of topic; far from it. The troubles were accepted and used as means to be applied in the improvement and building up of the sewer pipe manufacturer's business; as embodying lessons of wisdom, which had to be learned and could be learned only through experience, and the "troubles" contributed this material to experience.

The reader should find the inferences and see to it that he does find them in the paper and the discussions which were prompted by the paper.

The foremost mechanical authorities in the United States have said that the day of the steam engine is passing, and have hailed as its successor the producer gas engine. Germany is in a class by itself in the invention, design and manufacture of these machines; but enterprising manufacturers in the States have not been slow and have acquired many foreign inventor's rights under their American patents, and are now building them here.

The close reader of THE CLAY RECORD will recall cuts shown hitherto, and will find in the next issue a number showing the several prevailing designs.

This question of power generation is a vital one, and every user of power is, or should be, deeply interested in it for a multitude of reasons.

The modern steam plant using compound, condensing engines, and the latest and best improvements in accessory

equipment is unable to utilize over 10 to 15 per cent of the energy in a pound of coal; consequently 85 to 90 per cent is wasted so far as extracting the potential energy of the coal is concerned. Again, as the price of coal is steadily advancing the demand has been stimulated to a wonderful degree for cheap power.

The gas engine had become attractive, but it did not meet fully the demand for cheaper power using illuminating gas. Natural gas cut the cost practically in two, but it was not to be depended on, and as a consequence the builders of gas engines have studied for some method of producing gas cheaply. In Germany there has been developed during the past six or eight years what is known as the suction gas producer.

Previous to this all gas was made in pressure producers; that is, the gas was stored under pressure in gas tanks and drawn away as required.

The advantages of a suction gas producer are: Automatic generation of the gas by the engine; highest and best utilization of fuel; no boiler and no gas holder required; can be erected without danger in any convenient place; easy to start and to run; no soot, no smoke, no odor, no explosion possible; small floor space required; simple in operation and the first cost is much less than with the pressure producer.

We have seen a table of what it costs: The Producer Gas Engine using anthracite pea coal costing \$4.85 per ton, using 10 lbs. per horse power 10 hours, run cost for 50 h. p. for 10 hours \$1.11.

Gas engine using illuminating gas 18 cubic feet per horse power per hour, price of gas 80 cents 1,000 cu. feet, or say 180 cu. feet horse power for 10 hours, for 50 h. p., for 10 hours, \$7.20. Compared with Slide Valve Steam Engine, fuel consumption, 6½ pounds per horse power per hour; bituminous coal, \$3.00 per ton; cost of 50 h. p., 10 hours' run, \$4.87, or with a single Corliss Engine, using 3½ pounds per horse power per hour, same quality of material as the slide valve engine, and same price cost 50 horse power, 10 hours, \$2.62. In short, in comparison with a steam plant of the same capacity, only about one-third to one-fourth as much coal is needed while running; only about one-sixth the amount of coal is needed to bank the fire at night.

We have already stated there were several manufacturers of these appliances in this country. We saw recently one installed in the Grand Rapids Brass Co., built by the Minneapolis Mchy. Co., and the users were enthusiastic in their praise of the new motive power.

We are glad that we shall be able to print in the next issue the address delivered at a convention recently held in Champaign, Ill., by Prof. S. S. Wyer of Columbus, Ohio. This gentleman has made a deep study of this problem and the devices to which we have referred in this editorial, and we advise our readers to give it a careful reading. Prof. Wyer would be doubtless pleased to correspond with those desiring further information on the subject.

The Purington Paving Brick Co., Galesburg, Ill., turned out 78,600,000 brick during 1905, 6,000,000 greater than 1904.

OBITUARY.

Jacob W. Hayne died at his home in Goshen, N. Y., aged 75 years. He was formerly engaged in the manufacture of brick.

Benjamin Parker, a manufacturer of brick at Charleston, Ill., died at his home of cancer of the liver. He was 67 years of age.

W. G. H. Page, a well-known citizen of Lebanon, Tenn., died at his home, aged 75 years. He was engaged in the brick and contracting business.

Amos Kent, president of the Amos Kent Lumber & Brick Co., Kentland, La., died at his home where he had been a life-long resident. He was 94 years of age.

Charles Savignac, a well known brick manufacturer of Haverhill, Mass., died at his home of pneumonia after only a week's illness. He was born in 1860.

William P. Allen, treasurer and general manager of the Mercer Pottery Co., Trenton, N. J., died of a complication of diseases at his home. He was 64 years old.

J. S. Earnest, one of Shawnee county's oldest inhabitants, died at his home in Topeka, Kansas, of uraemic poisoning. He was engaged in the manufacture of brick east of the city.

Patrick Bannon, chief owner of the Kentucky Vitified Brick Co., and the P. Bannon Sewer Pipe Co., at Louisville, Ky., is dead. He was 82 years old and leaves six children.

PLAN TO KEEP NEGROES OUT OF BRICK YARDS.

Brickyard laborers along the Hudson river have organized a union and it is intimated that they will draw the color line next summer and demand of the manufacturers that they employ no more southern negroes.

The Fishkill Herald remarks that this is drawing the color line with a vengeance. The southern negroes who came here in the summer months to labor in the various yards are, as a rule, better citizens than the foreigners, they are more thrifty and cause less trouble than any class of brick-yard laborers. Many of them make deposits to the sum of several hundred dollars in the savings banks, which they not unfrequently leave behind them when they go south for the winter. For every colored brick-yard laborer that is in court for drunkenness and disorderly conduct there are at least ten Slavs, Dagos, Greasers, Syrians and what not. The Syrian brick-yard laborers at Dutchess Junction are ever and continually in a rumpus of one sort or another and when such people start out to draw the color line they are getting a little too far fetched.

If there must be a color line, let it be between the white men on the one side and the yellow and black men on the other. We think, however, that the color of a man's skin doesn't make much more difference on a brickyard than anywhere else. A news item says that there may be trouble in the river yards next season over this action of the union. Well, when the pot and the kettle get into a scrap, it is fun for those who are looking on—unless they happen to be paying for the damage done, as the manufacturers will be obliged to do, if there is any trouble on the yards over the "color line" next summer.

ACCIDENTS, DAMAGES AND FIRES.

H. L. Armstrong, trustee of the Topeka (Kansas) Brick Co., now in bankruptcy, has filed suits amounting to \$25,000.

The dryer in the Ft. Wayne (Ind.) Pressed Brick & Tile Co. caught fire and caused a loss of \$15,000. Plant will be rebuilt at once.

Suit has been started against the Denton (Texas) Pressed Brick Co. to secure possession of a one-half interest in land upon which the brick plant stands.

R. E. Payne, trustee, has started foreclosure proceedings on the plants of the Detroit Portland Cement Co., at Fenton, Mich., under a \$400,000 mortgage.

The U. S. Court has made an order adjudging the West & McLean Brick Co., and the partners, J. A. West, Z. F. Darrall and Robt. C. McLean, bankrupts.

Ralph Vogan, a jiggerman in the Thomas China Co.'s plant at Lisbon, Ohio, was found dead in an outbuilding. Death is supposed to be due to alcoholism.

The plant of the Dunbar (Pa.) Fire Brick Co. was destroyed by fire, causing a loss of \$75,000. One hundred and thirty-five men were thrown out of employment.

Peter Oswald, an employe of the Star Clay Co., Allentown, Pa., was killed in the clay pit by a cave-in. His father was killed in the same place six years ago.

Manitowoc (Wis.) Clay Products Co. was awarded a verdict of \$66,900 against the railway company which cut in two their property by running a track through it.

W. Goodwyn, an employe of the Southern Clay Mfg. Co., at Coaldale, Ala., met with a horrible death by being caught in a rapidly revolving shaft which caught in his clothing and literally tore him to pieces.

Eighteen separate suits, amounting to \$55,000, have been filed against the estate of John N. Ferris of Norwalk, Conn., alleging that Mr. Ferris induced them to buy worthless stock in the W. A. Underhill Brick Co., of Groton Point, N. Y.

RECORD BRICK OUTPUT.

At the annual meeting of the Central Brick exchange, New Britain, Ct., which has charge of selling the bricks manufactured by the principal yards of this locality, it was voted to double the capital stock of the company by increasing it from \$7,500 to \$15,000. The annual reports showed that the average output of brick by the members of the exchange during the past season exceeded by nearly 8,000,000 the figure for any previous year. The Phoenix Brick Company of Hartford was admitted to membership in the organization. These officers were elected: President, George H. Todd of the Park Brick Company of Elmwood; vice president, G. A. Pickett of the American Brick Company; secretary, R. Clifford Merwin of the C. P. Merwin Company; treasurer and general manager, Virgil P. Palmer.

The brick manufacturers of this vicinity have heard nothing further from ex-Mayor Wallen of Woonsocket, R. I., and J. Edward Studley of Providence, who have recently been making an effort to form a merger of the brick manufacturing interests of southern New England.

BOYD BRICK PRESS CATALOGUE.

Advance section of catalogue number fifteen has been received from the Chisholm, Boyd & White Co., of Chicago. It certainly does this firm proud the way it is gotten up, put together and printed. The Boyd six and five mold specials are splendidly illustrated on pages four and five and the two mold special and four mold Acme, on pages six and seven. Page eight contains cuts of the two-mold Acme which is the smallest size press built and page nine an all iron and steel, self-contained dry pan which the firm build in three sizes. The Acme clay mixer and feeder is found on page ten; it is constructed entirely of iron and steel.

The photo of the office and works of this well known plant appear on page two, and while it shows an immense building it does not begin to convey to the reader the amount of business that is done by the company. They employ 200 traveling men, do purely a mail order business and yet at a recent visit to the works the writer counted twenty-seven machines on the floor in some stage of construction. The castings are contracted for in quantities of one or two dozen at a time and the supplies that go to make up the machines are purchased in large numbers, thus reducing the cost to a minimum.

Any part of any certain size machine can be ordered and when received can be counted upon to fit. Machines are made especially for sand-lime brick, clay or shale of any size or capacity.

AMERICAN SEWER PIPE.

The condensed balance sheet of the American Sewer Pipe company, as of Dec. 31, 1905, compares as follows:

	1905. June 30.	1904. June 30.	1903. Sept. 30.
Assets—			
Cost of property, etc..	\$ 9,253,029	\$ 9,240,512	\$ 9,251,143
Cash	190,850	201,180	144,065
Accts. and bills receivable	342,565	437,359	533,227
Goods and supplies on hand	850,110	759,847	681,373
Totals	\$10,636,554	\$10,638,899	\$10,609,808
Liabilities—			
Capital stock	\$ 7,805,700	\$ 7,805,700	\$ 7,805,700
Bonds	1,532,00	1,533,000	1,587,000
Bills payable .....	.....	.....	75,000
Accounts payable	33,969	84,111	92,558
Wages accrued	30,754	.....	.....
Int. and taxes accrued.	39,734	40,016	22,437
Dividends	58,543	58,543	.....
Surplus	1,135,855	1,117,529	1,027,113
Totals	\$10,636,554	\$10,638,899	\$10,609,808

NEW PRESIDENT AND MANAGER OF COMPANY.

Mr. W. W. Cunningham, formerly treasurer of the Pennsylvania Clay Co., manufacturers of vitrified fire clay paving brick, with factories at Conway, Fallston and Monaca, Pa., has been elected president and general manager of the company. The Pennsylvania Clay Co.'s general offices have recently been removed from Rochester, Pa., to the Germania Savings Bank Building, Pittsburg, Pa.

THE PHILADELPHIA STEAM COIL BRICK DRYER.

Glen H. Dobbs of Camden, N. J., has put on the market a new dryer known as the Philadelphia Steam Coil Brick Dryer. It is meeting with great success wherever installed.

J. Byrne & Brother, 27th and Summerset Sts., Philadelphia, Pa., recently installed one of these dryers which is doing the best of work, and the Cliffwood Brick Co., of Cliffwood, N. J., after installing one of these dryers as a test about a year ago in November of last year installed another one or a second section and they now have in the third one or the third extension of the Philadelphia Steam Coil Brick Dryer. The Cliffwood Brick Co. made over 40,000,000 brick during the year 1905.

Mr. Dobbs does not herald his success with trumpets and horns, but no doubt would give anyone interested any information they may desire.

NO CHANCE FOR FOREIGN COMPETITION IN CHINA.

Special Agent Burrill writes that successful competition with the Chinese brickmakers is practically impossible, the low cost of production in China precluding outside competition. It might be worth while, however, to examine the Chinese brick kilns with a view to the introduction of American brick-making machinery. If American manufacturers can sell such machinery to the English and other European people they should be able to sell also to the Chinese. Mr. Burrill says there are two brick works in Shanghai in which steam machinery has been installed, which suggests that the Shanghai experiment, if successful, might be enlarged. Mr. Burrill writes:

While bricks are used on a large scale in China both by foreigners and natives for the construction of buildings, it is generally conceded that it would be useless for American manufacturers to attempt to place their product on this market because of the extremely low cost of production here. In addition to this the high freight rate charged on bricks from the United States to Chinese ports would, it is believed, absolutely bar them from competition. Furthermore, any effort to encroach on this industry would unquestionably be met by a decrease in the selling price, a result easily obtained by reducing the wage of native workmen and making an inferior quality of brick. Chinese-made bricks are manufactured from ordinary clay and are finished in red and blue. The most popular sizes are 5 by 10 by 2 inches and 6 by 12 by 2 inches, the former size being the kind used in foreign buildings. There is still a smaller size, which is used in the construction of native buildings. Blue bricks sell for from \$50 to \$120 Mexican per 10,000, according to the demand, and the red bricks bring from \$57 to \$130 Mexican per 10,000.

In Shanghai there are two brick works owned and operated by the Chinese, one of which is installed with steam machinery. It may be said that here, as well as throughout central and northern China, the supply of bricks readily meets the demand, and that it is a monopoly with which even Japan would hesitate to compete because of the small returns.

ANNUAL MEETING OF CLEVELAND HYDRAULIC PRESS BRICK CO. HELD AT ST. LOUIS.

At the annual meeting of the Cleveland (O) Hydraulic Press Brick Co., in St. Louis, F. F. Prentiss, president of the Cleveland Twist Drill Co., was made a director and elected a vice-president of the company. W. H. Hunt of Cleveland was re-elected treasurer and general manager. The directors are H. W. Eliot, F. G. Middlekauff, George F. Baker and E. C. Eliot of St. Louis, Mo.; F. F. Prentiss and William H. Hunt of Cleveland, and O. C. Barber, president of the Diamond Match Co., of Akron.

The following officers were elected:

President, H. W. Eliot; first vice-president, F. G. Middlekauff; second vice-president, F. F. Prentiss; general manager and treasurer, William H. Hunt; secretary, C. A. Bliss.

The concern has a plant at South Park which is being enlarged this winter so as to make the company the largest manufacturer of red facing brick in the United States. The new equipment gives facilities for making every variety of high-grade facing product.

AN ALBANY COMPANY WILL BUILD NEW PLANT.

The increase of capital stock of the Newton Fire Brick Company of Albany, N. Y., from \$100,000 to \$350,000 was for the purpose of constructing an entire new plant. The business of this corporation has grown to such an extent during the past year that it is unable to conduct its operations longer in the plant which it now operates in the northern section of this city. It will build a new plant and it will build it in Albany if it can secure a site favorable to its needs.

It is reported by those who are aware of the operations of the company and its project that such obstacles have been placed in the way of securing a site which will afford it the proper railroad and water facilities that it may be compelled to move the industry from this city. If a site is not secured within a short period the company will construct a plant in New Jersey. If this is done Albany will lose an industry which has operated in full for many years. The company, which was reorganized some two years ago, employs over one hundred men and when its new plant is in operation it will employ about 250. The increased number will be well paid, receiving from \$15 to \$21 per week.

NEW YORK BLOWER'S NEW CATALOGUE.

The New York Blower Company have issued lately a condensed catalogue on their goods, which is just the thing for a busy man who has no time to look through a complete set of catalogues.

It shows illustrations of all styles of fans and heaters made by this company, besides giving in tabulated form the principal dimensions and prices. The New York Blower Company will be pleased to send same to anybody applying for it to 25th Pl. and Stewart Ave., Chicago.

Be sure to write for one.

SAND OR LIME BRICK OR BLOCK NEWS.

F. Gaffney, Shelby, N. C., will enlarge his brick works and install an equipment for making sand and cement brick.

The Commercial Club of Crete, Nebr., have made a proposition to an Iowa concern to establish a sand brick plant in that city.

W. C. Mitchell, representing the Western Composite Brick Co., has practically made arrangements to establish a sand cement brick plant at Enid, Okla.

The Hastings (Nebr.) Pressed Brick Co. has been putting in new and improved machinery to their sand lime brick plant. The plant is run night and day.

The United States Brick Corporation, Michigan City, Ind., are facing the walls of its buildings with their own sand lime brick. The company are making many sales.

The Schwartz scientific process will be used in the plant at Grand Rapids, Mich., which is to be put in by D. L. Stiven. The plant will be in operation by the first of May.

The Cooperstown (N. Dak.) Tile Works have bought a cement post machine and will make and sell fence posts. They have secured the agency for the machine in North Dakota.

The Salina (Kansas) Stone Co. is putting in a new design stone machine which will turn out 10,000 brick per day, also a machine for making door sills, window caps and water table.

The Steger Sand Lime Brick Co. has been formed at Van Couver, B. C., to make sand lime brick out of the tailings of the Britannica. Col. W. B. Dickie is at the head of the enterprise.

The West Tacoma Sand Lime Brick Co., Tacoma, Wash., will soon be turning out 20,000 brick daily. The plant is located near the mouth of Chambers creek. Henry Hewitt, Jr., is at the head of the concern.

The Monongahela Petrified Brick Co., which has a plant in operation at Clairtown, Pa., making concrete blocks will install a similar works in West Elizabeth. They use cement, sand and granulated furnace slag.

The Sibley (Mich.) Brick Co., have one of the best offices for sand lime brick in the United States. It is built entirely of sand lime brick inside and out, is 90x45 feet in size, one story high and cost over \$10,000.

The Rochester (N. Y.) Concrete Building Material Co. has been incorporated with \$5,000 capital stock by Geo. R. Knickerbocker and E. I. Minnamon of Pittsford, N. Y., and Geo. A. Cooley and R. S. Bostwick of Rochester.

The Intermountain Building Material Co., Boise, Idaho, has been organized and \$17,000 worth of machinery purchased to make sand lime brick. The plant will be started up about the first of May with J. W. McLean as manager.

The Red Wing (Minn.) Brick Mfg. Co. recently elected the following officers: C. A. Betcher, president; B. Gerlach, vice-president; J. J. Bovy, sec.-manager and C. F. Hjermstad, treasurer. The capacity of the plant will be increased.

MISCELLANEOUS ITEMS.

Alonzo Rose has bought land at Port Ewen, N. Y., and will put in a brick yard.

Wm. Worthman & Sons, Seward, Nebr., have sold their brick plant to a Hastings firm.

Wm. Slemmer and Joe Copley, Upper Sandusky, O., will build a brick works at 8th and Church Sts.

The Theriault Red Brick Co., Chippewa Falls, Wis., has been incorporated with \$15,000 capital stock.

C. E. Bolles has purchased of S. T. Kimball the controlling interest in the West Chicago (Ill.) Brick Works.

The Newton Fire Brick Co., Albany, N. Y., have increased their capital stock from \$150,000 to \$350,000.

Knight & Gilbert is the style of the firm that will operate the Geo. I. Knight brick works at Bowling Green, Ky.

The Old Furnace Fire Clay Works at Salineville, O., will be started up again after an idleness of four years.

J. E. McTwen, Matthews, N. C., contemplates the establishing of a brick works with 20,000 daily capacity.

The erection of the Shawnee (O.) Flash Brick Co.'s plant has been begun. E. M. Starner is the general manager.

Geo. M. Reynolds, Utica, Ill., has leased his clay bank to Pittsburg capitalists and a \$200,000 clay plant will be installed.

The Horatio (Ark.) Fire and Building Brick Mfg. Co., with \$100,000, has been incorporated by W. H. Maddox, of Texarkana.

Bartlett Bros. will double the capacity of their brick yard at Hudson, N. Y., using 10 machines. The plant is operated by electricity.

The Elmira (N. Y.) Shale Brick Co., has purchased the Kirk property, which adjoins their property, so that they can expand.

Messrs. Acton & Killgore have sold their 10-acre tract of land south of Alvin, Texas, to the Alvin Brick & Tile Co., for \$10,000.

W. H. Barker of Boise has found a vein of brick clay near Heyburn, Idaho, and tested same and ordered machinery for a plant.

David Steumpfle's Sons, Williamsport, Pa., will erect a large brick plant on the south side, that will have 30,000 brick capacity daily.

The St. Anna Brick & Tile Co., has been incorporated with \$15,000 capital stock by A. Mailloux, F. H. Meiers and J. B. Brouillette.

The R. R. Lambert Co., Alleghany, Pa., has been incorporated. Directors: J. C. Bily, Alleghany; H. M. Boas and John J. Heard, Pittsburg.

The Hollywood Brick Co., York, Pa., has been incorporated with \$25,000 capital stock by John J. Landis, S. F. Glatfelter and James W. Kilgore.

The Ohio Valley Clay Co., Steubenville, O., has been incorporated with \$200,000 capital by J. J. Gill, R. L. Brownlee, G. W. McCook and S. G. Gill.

J. T. Roth, Allentown, Pa., will sell out his brick yard and retire from business, the clay being exhausted.

The New Era Development Co., Roanoke, Va., has been incorporated with \$15,000 capital stock to make brick, etc.

Brower & Port, proprietors of the Alden Brick Works, at Thompsonville, Ct., are making many improvements to their plant.

The Old Horell brick yard on Cocheso St., Dover, N. H., has been sold to Richard R. Morris of Epping, who will start burning at once.

The Georgia Brick Co., Athens, Ga., has been incorporated by James M. Smith, C. M. Booth, T. H. T. McPherson and C. T. Hussey.

The Amman & Wood Brick Works at Oklahoma City, Okla., has been sold to F. S. Wood and Conrad Amman of Decatur, Ill., under a forced sale.

The Warrick Roofing Tile Co., Newburgh, Ind., has been incorporated with \$25,000 capital stock by H. A. Wartman, Geo. W. Uhl and Chas. W. Cook.

The Porcelain Faced Brick Co., 192 Market St., Newark, N. J., has been organized with \$20,000 capital by John J. Meeker, Edwin S. Rankin and W. P. Meeker.

The M. A. Staley Co., Chicago, has been incorporated with \$30,000 capital stock, to manufacture brick by T. T. Sullivan, James D. Marnane and John J. Staley.

The De Noyelles Brick Co., Haverstraw, N. Y., has been incorporated with \$60,000 capital stock by Daniel De Noyelles, Martha R. Anness and B. L. De Noyelles.

The Roanoke (Va.) Clay Mfg. Co., which was organized several months ago, has completed its plant on the Roanoke & Southern Ry. and put it into operation.

The New System Brick Co., Toronto, Ont., has been organized with \$50,000 capital stock by Fred Perry, C. W. Bush, J. L. Richardson, H. J. Wilson and J. A. Mitchell.

Crum Lynne, Delaware Co., Pa., is to have a large terra cotta works that will employ 150 men. The Ketchum Terra Cotta Co., of Philadelphia, is the company that will build.

The Marysville (O.) Clay Mfg. Co. has been incorporated with \$30,000 capital stock by Dan. M. Rutan, J. H. Shearer, N. E. Leggett, F. W. Shaw and H. E. Conkright.

J. A. Wilson of Dows, Ia., has purchased the brick and tile factory at Lohrville and will operate same in connection with the one at Dows. He will make several improvements.

Wilson B. Bechtel has withdrawn from the firm of Bechtel Bros., Waterloo, Ont., and will establish a modern and complete brick-making plant of his own that will cost \$15,000.

The Perry Mfg. Co., Belle Vernon, Pa., has decided to go into the manufacture of brick and plans are now being made that will cost \$50,000. C. F. Eggers, president; J. F. Torrence, secretary.

P. A. Overmeyer & L. M. Hess have bought the tile factory of J. W. Boyer & Co., which they will move to a new location in town, and Johnson-Keyt Co. is erecting a new plant for the manufacture of brick, tile and building blocks at Lindsey, Ohio.

The Junction City (O.) Sewer Pipe Co. has been incorporated with \$75,000 capital stock by M. M. Roudebush, C. C. Stacy, John D. Fowler, George Wolf and J. C. Stotzenbeck.

The Carrollton (Mo.) Brick & Tile Co. has been absorbed by the Brick Mfg. Co. of Carrollton. L. A. Harding has been elected manager, and he will keep both plants in operation.

The Keystone Fire Clay & Brick Co. has asked for a charter and will build a plant at Fogelsville, Pa. Edwin C. Kramlich, F. E. Lewis, S. J. Kistler and J. T. Roth are interested.

The Atkinson Brick Works, of Wilmington, N. C., has been incorporated with \$25,000 capital stock. Incorporators; R. L. Ward and J. E. Sharp of Atkinson, and E. R. H. Strunk, of Wilmington.

A meeting was called at the Martinton (Ill.) Bank to discuss the starting of a brick and tile plant at that place; also the buying of the machinery of H. C. Jones, who formerly ran the tile mill at the river.

The F. H. Brockett Co., North Haven, Ct., has been incorporated with \$10,000 capital stock and will engage in the manufacture of brick. Incorporators are Fred H. Brockett, C. T. Brockett and Myron R. Brockett.

The Hillsboro (N. D.) Brick & Tile Co. has been incorporated with \$15,000 capital stock by E. C. Haagensen, N. H. Wold, J. L. Johnson, J. O. Lee, Ole Aarstad, E. A. Viker and M. Skogen, all of Hillsboro.

The property owners of the 2nd ward, Los Angeles, Cal., have succeeded in forcing through the court the Berg & Oxby brick works to move its plant within two years on account of the noise and smoke nuisance.

The Kohl Hepp Brick Co., New York, has been incorporated with \$100,000 capital stock. Incorporators, L. P. Sherer, 29 Crawford St., E. Orange, N. J.; James Hess, 21 Park Row, and Robt. Livingston, 27 Williams St., New York.

R. R. Stuart has been elected president and general manager of the National Web Tile Sewer Pipe Co., Syracuse, N. Y., to succeed William K. Never. The other officers are John Mora, vice-president, and J. F. Plumb, secretary and treasurer.

THE MAMMOTH KAOLIN BEDS

Deposit 15 to 20 feet thick, covering 500 acres and unexcelled for making Tile, Terra Cotta, Porcelain, Builders', Moulders' and Potters' coarse and fine clay products. It will keep 100 factories in operation for two centuries. Excellent sites and natural facilities for manufacturing plants. **Will sell, lease, bond or work on shares.** Reasons.—Owners not practical or clay men. Located near Railroad in Cedar Valley, Utah. Investigation invited. **This clay has won two Worlds' Fair prizes.** One at St. Louis, 1904, and one at Portland, 1905. **It is pure China Clay**, and that of Cornwall, England, is no better. Also a large deposit of Silica Sand, 99 per cent pure. Send for samples. Address,

HOMER J. KENDALL
LEHI, UTAH

CLAY RECORD.

FOR SALE OR LEASE.

A 32-acre farm, 4 miles west of Macomb, Ill., containing 20 acres of a 10-foot vein of fine pottery clay, with a 5x10 foot shaft in good repair. Also a vein of coal 25 to 30 feet below the clay. Land for sale at \$85 per acre, half cash, balance on long time, one to ten years at 5 per cent. or 6 per cent discount for cash on deferred payment. For full particulars call at premises or address

MILTON W. McDONALD,
Lock Box 39, R. R. 5, Colchester, Ill.

FOR SALE.

One complete brick yard plant, consisting of boiler and engine, stiff mud machine, rolls, automatic cut-off, shifting pulleys, belting. Complete equipment for a 25,000 capacity plant. A bargain if sold at once.

WM. W. THIRLBY,
Traverse City, Mich.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

Profitable running brick plant, 25,000 capacity. Ready sale for entire product. Owner has larger interests requiring attention

TERRA HAUTE PRESSED BRICK CO.
Terra Haute, Ind.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address
T, care Clay Record,
Chicago, Ill.

FOR SALE.

For sale, reasonable, in condition—

One 5x18 foot Horizontal Tubular Boiler.
One No. 20A Penfield Hollow Brick Machine.
One 14 foot Pug Mill.
One Disintegrator.
One 40 foot Clay Conveyor, with 20 foot belt.
Forty Fire-proofing Dies, with two extensions, pulleys, clutches and belting.
Reasons for sale, are making different ware.
R. 611, W. 51st St.,
New York City.

WANTED

Wanted at Once.—A first class experienced brick burner and setter. State age, experience, salary expected and reference.

B. S. ELMES
Fergusson's Wharf, Va.

FOR SALE.

A brick and tile factory, located in Washington Co., Iowa, in a prosperous condition. Would consider an Illinois or Iowa farm.

E. L. TEAL,
Anderson, Ind.

FOR SALE.

A second-hand Four-Mold Dry Press. Has not been used more than a year. Good condition of repair guaranteed. Also good second-hand 44-inch Pulverizer. Address

BOSTON,
Care Clay Record, Chicago, Ill.

FOR SALE.

One 25-horse power Engine and one Henry Martin steam power Soft Mud Brick Machine. Address
LOUIS SCHMIDT,
Grand Island, Neb.

WANTED.

A second hand No. 6 Brewer Brick and Tile Machine. Address
EDMONDSON & ROGERS,
Kalona, Iowa.

Machinery For Sale.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.
Both styles of cars in first-class repair.

ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address
"GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.

THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new. DEALER,
Care Clay Record, Chicago, Ill.

FOR SALE CHEAP.

One second-hand Chandler & Taylor 80 horsepower Horizontal Tubular Boiler, 60 inch diameter by 6 feet long, with full flush front.

AMERICAN CLAY MACHINERY CO.
Bucyrus, Ohio.

FOR SALE.

One 70 horse power Frost Tubular Boiler, one 45 horse power Frost Slide Valve Engine. In good condition, will sell cheap as we have changed to electric power.

CENTERVILLE BRICK & CONSTRUCTION CO.
Centerville, Iowa

WANTED.

An experienced and competent brickmaker to take charge of soft mud plant near Cincinnati. State experience, references and wages expected. GENERAL SUPPLY & CONSTRUCTION CO.
24 State St., New York.

BRICK PLANT FOR SALE.

Splendid Chance for Contractor.

One of the finest, most modern brick plants for sale in southern part of Central Illinois. Live growing city, good prices, making money. Dry press, built in 1904. Best of reasons for selling. Price \$25,000, if taken at once. Address
ILLINOIS, care Clay Record.

POSITION WANTED.

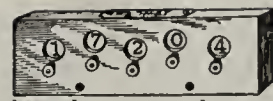
Wanted, position as foreman or manager of a Dry Press Brick Plant of not less than 20,000 brick per day. A number of years experience. Address
ELLIS,
Care Clay Record, Chicago, Ill.

FOR SALE CHEAP.

A good second hand
E. M. Freese & Co.,
Brick and Tile Machine.
Address
E. R. K., Care Clay Record, Chicago.

FOR SALE

The Newport brick and Tile plant at Newport, Indiana. Address
JOHN RICHARDSON, Receiver.



Paper Joggers quoted.
R. A. HART, 41 White St.,

No better made, cut from
\$8 and \$10, to
4 Wheel, \$3.00
5 Wheel, \$3.25
Guaranteed.
Sold by all dealers.
BATTLE CREEK, MICH.

FOR SALE.

Up-to-date brick plant with Creager machinery, in prosperous city of 15 000 inhabitants, in Southern Illinois. Good residence and farm of 40 acres attached to plant. Splendid opportunity. Only plant in city. Address

H. H., care Clay Record, Chicago.

MACHINERY FOR SALE.

One 4-mold Simpson Dry Press. One Steadman Pulverizer. All size boilers and engines from 30 h.p. up. Send for list.

MERTES MACHINERY CO.
Milwaukee, Wis.

POSITION WANTED.

Position as manager of brick or tile plant, by an experienced man. Can build a complete up-to-date plant and operate it successfully. Address

UP-TO-DATE,
Care Clay Record, Chicago.

FOR SALE CHEAP.

First-class brick and tile plant. Good machinery. unlimited clay supply, 25,000 capacity daily, 3 kilns 170,000 capacity, dry sheds, etc. Track connections, A snap if taken at once. Address

H. C. MODLIN, Secretary,
Perry, Iowa.

ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

FIRE CLAY LANDS.

500 acres underlaid with heavy vein superior fire clay and light vein coal, which can be mined cheaply, on the line of the N. Y. C. & H. R. R. R., in Pennsylvania, for lease on royalty at low price per ton. For further information address the owner.
BOX No. 308, Williamsport, Pa.

FOR SALE OR EXCHANGE.

One of the best small brick and tile plants in Southern Michigan. 20,000 capacity, Stewart patent kilns, good drying sheds, all machinery in first-class condition, fine clay, good market. Will sell at a bargain or will exchange for good real estate. Address,
MICHIGAN,
Care Clay Record, Chicago

FOR SALE.

31-Acre tract of land located in Central Iowa. The finest kind of clay underlaid with coal. Two roads running up to the line of property.
ARTHUR H. LIBBY,
233 Railway Exchange Bldg., Chicago.

FOR SALE

One Fate & Co. Brick and Tile Machine, "D" size.
One Fate & Co. Automatic Tile Cut-Off Table.
One Fate & Co. Side-Cut Lubricating Die.
One Fate & Co. Brick Cut-Off Table, pallet delivery.

Fire Kiln Bands for 22-foot kiln.
J. C. LANTZ & SON,
Mansfield, Ohio.

PALLETS WANTED.

Wanted 3500 all steel foot pallets, 36 in. long by 10 1/2 in. wide by 3 1/4 high. State gauge of steel, width of foot and general details.

FAYETTE FIRE BRICK CO.
Uniontown, Pa.



Vol. XXVIII. No. 5.

CHICAGO, MARCH 15, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

A REPORT OF THE TWENTY-EIGHTH ANNUAL MEETING OF THE ILLINOIS CLAYWORKERS' ASSOCIATION.

FOURTH SESSION

The fourth and final session of the twenty-eighth annual meeting of the Illinois Clayworkers' Association, at Elks' Auditorium, Champaign, President John W. Stipes in the chair, was called to order at 10:30 o'clock Thursday morning, January 25th, 1906.

President Stipes: Gentlemen—We will open the meeting this morning with a paper on "The Advantages of Brick Pavements," by Professor Ira O. Baker, professor of civil engineering, University of Illinois, and author of a treatise on roads and pavements.

Professor Baker: Mr. President and Gentlemen—I am just a little bit embarrassed, because the paper I have in my pocket does not have the same heading as the title that was announced. Some way, we "slipped a cog."

I suppose brickmakers are always ready to hear discussion on the question of brick pavements, and perhaps the matter got upon the program because some of you thought, or believed, or knew, that I did write on The Brick Pavement. If I did, I don't know that I could say anything new to you or to anyone that I had not stated before. I know, however, that the brick pavement has a very large field, and assuredly for the smaller cities, perhaps, it is the only pavement available. Another item on the program, a little further down, will give people who desire to, an opportunity to air their views on the merits of the brick pavement as compared with those of some other kind of pavement.

I was once in court where they were hearing objections to a pavement—and for the present it don't much matter what kind of pavement it was—and I was astonished at what seemed to me a lack of comprehension on the part of the lawyers and even the witnesses, of the grounds upon which we should depend in the allotment of the cost of a pavement; and it occurred to me at that time that it would be well to carefully study the advantages of a pavement with a view to having the public understand those advantages—the advantages accruing to the public and those that accrue to the abutting property holder—in order that the public and the property owner may understand the cost of the pavement, and what proportion of the cost should be allotted to the public and the property owner, respectively. With that object in view, I have prepared this paper, thinking that perhaps the members of this association are interested at times in promoting the construction of pavements.

I suppose, of course, you are most interested in the construction of brick pavements; but the proposition is a general one and applies

to other forms of pavement as well—The Advantages of Effective Pavements.

BENEFITS OF PAVEMENTS

The writer was present once in court when testimony was being taken for and against the construction of a particular pavement, and was greatly surprised at the seemingly imperfect comprehension by both the attorneys and presumably expert witnesses of the available arguments. As far as the writer has observed, there is no discussion of this subject in print, except a brief article by the writer of this. Doubtless a considerable number of the members of this association are interested in the extension of pavements, and may therefore be interested in a general statement of the benefits to be derived from pavements. The effect of pavements upon city life is so important that no enumeration is likely to include all of the benefits; but nevertheless it may be of value to enumerate some of the more important of the benefits resulting from the construction of pavements. Further, since the chief, if not the sole objection to a pavement is its cost or the manner of assessing this cost, we will in considering the benefits also incidentally inquire how each particular benefit affects the equitable distribution of the cost. We will first consider those benefits which chiefly accrue to the abutting property, and later those accruing chiefly to the city at large.

Benefits of Pavements.

1. A pavement establishes a permanent grade, which is a matter of importance to the abutting property when other improvements are to be made. Of course, the objector can claim that a grade can be officially established before the construction of any pavement is even contemplated; but it is sufficient to answer that it is seldom, if ever, done, and further that in some cases at least, the grade should not be established until the kind of pavement has been decided upon. The benefit of an established grade accrues wholly to the abutting property.

2. A pavement adds to the appearance of the street by giving a uniform surface instead of the irregular one of an unpaved street. Citizens spend money to improve the exterior appearance of their houses and to beautify their lawns; and why not also spend something to improve the appearance of the street in front of the property? A lot facing good houses and well-kept lawns always sells for more than one having a less pleasing outlook, and a good pavement improves the outlook from any property. However, the writer is not trying to prove that this element of value exists, but is trying to show that the pavement creates a part of this value. This benefit accrues chiefly or wholly to the abutting property.

3. A pavement increases cleanliness, since a paved street is less

dusty in a dry time and less muddy in a wet time than an unpaved street. Of course, an illy kept pavement is untidy, but even then a paved street is always more cleanly than an unpaved one; and further, a pavement may be kept perfectly clean, while an unpaved street cannot be kept clean under the most favorable conditions and with the utmost care. This benefit accrues wholly to the abutting property.

4. A pavement increases the healthfulness of the neighborhood by preventing holes filled with mud and filth. Since the recognition of the mosquito as an agent in the dissemination of contagion, this is, in some localities at least, an important consideration. This benefit affects chiefly to the abutting property, but it also extends to the entire neighborhood and possibly to the whole city.

5. Pavements, or rather good pavements, lessen the tractive power and decrease the cost of transportation, either by increasing the size of the load or by decreasing the time required for a trip. This benefit accrues chiefly, or rather directly, to those using the pavements; but in the long run it will, through the effect of competition, be distributed to those residing on the abutting property, and also to those residing in the neighborhood of the pavement, and even to the whole city, for a decrease in the cost of doing business benefits the whole city.

6. Pavements increase fire protection by facilitating the transportation of fire apparatus. This benefit may at any time save to an abutting property holder the entire cost of his pavement, and this benefit may even reach to adjacent unpaved streets.

7. Pavements permit pleasure driving at all seasons of the year, and facilitate social intercourse. This may be regarded as one of the luxuries of a pavement, and its importance will be valued very differently by different people, according to their appreciation of luxuries or their ability to pay for them.

8. Pavements allow the use of bicycles, which furnish cheap transportation and healthful recreation to many. In a few cities at least bicycle paths have been constructed on the sides of unpaved streets, which shows that the bicycle travel was sufficient to justify a considerable expense for its accommodation.

It is impossible to assign a money value to each of the preceding eight benefits of pavements, for each will vary with the local situation and with the judgment and the financial ability of each individual. Many affairs in life are too complicated to be expressed in arithmetical terms, and the benefit to accrue from the construction of a pavement is certainly one of them. There is one thing in this connection that is frequently overlooked, viz.; that the benefits of a pavement are enjoyed every day for several years—at least during the life of the pavement—while the payment is made on only one day annually for five or ten years.

In discussions of this character, more particularly those relating to the advantages of hard roads, it is frequently assumed that the consequent increase in the value of the abutting property is to be counted as one of the benefits of the improvement; but the real fact is that the increase in value is only the measure of difference between the benefits and the damages due to the improvement, and therefore ought not to be included with the others as one of the benefits. Further, the increase in value of the property is of no advantage unless it is to be sold. There is a certain satisfaction in knowing that the house in which we live has increased in value since we built it; but when the tax assessor comes around, we are not so ready to congratulate ourselves upon the advance in price of our property.

Disadvantages of Pavements.

It is usual to think that the only disadvantage of a pavement is its cost, but a moment's reflection will show that there are some other real disadvantages. This being the case, it is the part of wisdom and also good business policy to give them consideration. Except cost, there are but two objections to pavements, noise and dust.

The paving of a particular street may attract travel from adjacent unpaved streets, and thus convert a comparatively clean and quiet street into a decidedly noisy and dirty thoroughfare, in which

case it is conceivable that the pavement might be of more detriment than benefit to the abutting property. Doubtless this is an extreme case, but nevertheless it does sometimes occur, and the failure to recognize the condition has caused confusion and increased the difficulties of securing the pavement.

Apportionment of the Cost.

There is much discussion as to who in equity should bear the cost of the pavement. There are three distinct views.

1. A few claim that as they own neither a horse nor a vehicle and do not use the pavement, they should not be required to pay for it. Although a resident may not travel upon the pavement, it is used by those who serve him; and a pavement confers other benefits besides those relating to transportation, as has been stated. As a matter of administration, it is entirely impracticable to distribute the expense according to the use made of the pavement.

2. Others claim that the pavement is for the benefit of the general public of the city at large, and hence the abutting property should pay no more than that in other parts of the city. This claim ignores the fact that the abutting property secures a distinct benefit for which it should be required to pay. Laying at least part of the cost upon the property tends to discourage a demand for lavish expenditures for unnecessary improvements, that possibly might be insisted upon if the city contributed the entire cost.

3. Many hold that the benefits accrue only to the abutting property, and that therefore the owner of the abutting property should bear the entire cost. This claim disregards the fact that the pavement is for the use of the general public, and that it benefits all the people and all those having business interests in the city. An improvement in any part of the city is an indirect benefit to the city as a whole. In excuse of this method of assessing the cost, it is sometimes claimed that, although the pavement confers a general benefit, the inequality will be compensated when all the streets are paved. The answer is that all the streets may never be paved, and besides, traffic naturally concentrates on certain lines and nearly ignores certain others, and therefore some pavements will require much more care and expense than others. Further, there should be no objection to letting every property holder pay a part of his ultimate share as the work progresses, instead of paying it in a lump sum when the street in front of his own property is paved.

Usually either the second or third method or a combination of them obtains; that is to say, the entire cost of the pavement is assessed against the city at large or wholly against the abutting property, or the cost is divided between these two. Apparently the latter is the more equitable. As a rule the eastern and southern cities pay a larger proportion of the cost of pavements than do the western. This difference in practice is probably due chiefly to the limited revenues of new cities and to the many demands upon the general tax for the numerous and varied necessities of rapidly growing municipalities; consequently the cost of pavements, improvements having a definite local benefit, have been charged to the abutting property. It is equitable and just that the cost should be borne jointly by the private property and the city at large, since then the cost falls upon both interests which directly profit by the improvement, and neither receive a substantial benefit without sharing in its cost.

Ordinarily the proportion of the expense to be borne by the municipality and by the private property is determined wholly by financial considerations or usage, and is made uniform over the entire city, while equity and justice demand that a distinction should be made depending upon the character of the traffic. The interests of the general public in a street vary greatly between a residence street, a business street, and a general thoroughfare. To pave the first the public should pay only a small share, say, 20 to 30 per cent.; for the second, say 40 or 50 per cent., and for the third 60 or 75 per cent. Some such variation in the proportion to be borne by the two interests finds further justification in the fact that if the street becomes a general thoroughfare some of the benefits usually assumed as accruing to the abutting property may be nullified by the noise and dirt, as previously explained.

The preceding somewhat elementary principles have been presented with the belief that a clear understanding of them by those seeking to promote paving improvements will facilitate the work and aid in securing equity and justice. Of course, it is useless to expect that in such matters there will be no opposition, or conflict of opinion, or diversity of interest, but a fair recognition of the principles involved is necessary to an equitable adjustment.

Dr. Converse: This subject is well worthy of discussion; and I want to say to Professor Baker, and to the rest of us, that he has just made the fairest presentation of the paving question that I have ever heard. (Applause). It is the fairest to all concerned. I am not sure but that he ought to have been a lawyer instead of a plain professor. (Laughter). But he is perfectly fair and unprejudiced in all directions and from every standpoint. No one reading that paper can well reach other than a right conclusion upon what is necessary and proper in the laying of all pavements.

I don't know of any phase of the paper that I would be disposed to criticise. I listened to it attentively, was pleased with it, pleased with the argument. It seems to me that any individual disposed to be in any way public-spirited, could get views and information from the perusal of that paper which would serve to enlighten him fully upon what his duties, obligations and privileges are with respect to the laying of pavements on the public streets.

I have not another word to say concerning this paper.

D. E. Morey, (Ottumwa, Ia.): I can but repeat what has been already said. The paper is about as fair an exposition of the matter as I have ever heard.

There is a general misunderstanding of those things that the paper treats of, and when paving questions come up, the owners of the property to be benefited, who are the fellows who ought to pay for the pavement, have all kinds of excuses and reasons to urge why they should not be called on to pay anything. An even and equitable distribution of the cost of the pavement, without the friction resulting from resistance on the part of those who are benefited and long drawn out contests in the courts, would make it cheaper for everybody.

Professor Talbot: Mr. President—Perhaps I might add to this, as I think it is a topic in which brick manufacturers ought to be better versed in order to be able to put before the people a wider knowledge of the real foundation for the pavement assessment.

Another reason for the difference in practice between the cities of the Middle West and those of the East and South as to distribution of the cost of pavements between the city and abutting property owners is that the requirements of the state constitutions of these states of the Middle West make a limitation in the amount of tax which can be raised for civil purposes, and the amount of bonds or other indebtedness which the cities may have or assume, which is not common in the older states of the East and South, and that has resulted in the use of that special form of taxation called "Special Assessment" by means of which they can secure the amount necessary for the construction of the improvement or pavement.

So far as the matter of benefits as discussed and adjudicated in the courts is concerned, the courts have the practical rule that the increase in the value of property is the actual measure of whether the tax-payer is or is not benefited more than the amount of the assessment or the cost of the improvement; and while we may put it on some other basis, it comes back actually to that in their treatment of these cases; so that in the presentation of these matters before the courts it is quite desirable to show that there has been this benefit through the rise in the value of the property. Now, the ordinary custom among lawyers on the one side is to get all the people who will say that the pavement is no good, that it will not benefit the property, while the other side brings in an equal number or perhaps more people who will say that the pavement is the finest thing in the world.

Now, that, it has always seemed to me is not a very good basis for the making or levying of special assessments, and the courts ought to permit the introduction in their proceedings, and give to

them their proper weight of influence, the real reasons for the construction of such a pavement, such as have been given this morning by Professor Baker; but usually they will not permit this presentation. I remember being on the witness stand once in a matter of this kind when the attorney would not allow me to give any reasons why the property was benefited; so he did not ask me that on examination. I had, however, a good opportunity to and did, on the direct examination give the increase in the value which I thought would accrue to this property, and about the first question on cross-examination was how I came to that conclusion,—what I had based it upon; and that was just what I wanted, and I told them that the increase in the market value of the property was due to these advantages arising from the presence of the pavement and I started to tell just those things that have been presented in this paper; but I was stopped short by the attorney who didn't want that; but I thought I had to answer the question in all fairness to myself and to those by whom I had been summoned to testify, and finally appealed to the court to be given the right to complete my answer. Some little discussion between the lawyers followed, and then the stenographer was called on to read the question and answer as far as it had been made, and the court ruled that I had a right to complete my answer; and I did go ahead then and give the reasons why I felt that this piece of property would have an increased valuation as due to this improvement. And it seems to me that that ought to be permitted in such cases.

Perhaps one other advantage could or might be added to those that have been given, and perhaps is already included in the proposition laid down. that the construction of a pavement does tend to fix the character of a street: It is this, that by improving the character of a street with a pavement of a high order of material and construction, it is lifted or raised from the level it has formerly or ordinarily occupied. But the owner of a lot too often ignoring possibilities and disregarding the future, instead of constructing a good, high-class improvement or pavement proceeds on the assumption that the street will always continue upon the same line and level it has always been, completing the improvement with that expectation. At any rate, if he should have the enterprise, ambition and spirit to install a pavement of the best material of brick laid after the best methods in vogue, it will prove one strong evidence to him of one of the most potent agencies in fixing the character of the street it should necessarily be.

Dr. Converse: Pardon me, gentlemen, I want to allude to a phase of the question suggested by Professor Talbot that I don't believe Professor Baker touched upon,—but I am not sure but what he did. There is a value that comes to every property before which a properly constructed pavement is laid, arising from benefits far in excess of the cost of the pavement, and these lie in—and you may think it a little finely spun—the aesthetic qualities of a paved street. The elder Vanderbilt, when in control of the Hudson River Railroad, got it into his head that his men were spending a good deal of unnecessary time in polishing up the brass on their engines, and so he had a lot of new engines turned out in plain black, devoid of all suggestion of brass ornamentation, but with all the capabilities for service as good engines, and he said that he soon found out his mistake. He said that he had given them an engine in which they took no pride. Now, gentlemen, pride may be something which many good people ignore, but I want to tell you, there is a great deal in it. The men and women who have a degree of pride take better care of their bodies, there is no question about it; in regard to their household, they take better care of their property and surrounding, they have better houses, and those houses are better cared for, and the results arising are seen in greater affluence of belongings and of pocket. You give a man an old "plug" of a horse, and he will get all he can out of him, never undertaking to make his coat shine, or to put a little more meat on his bones. But let him have a better looking, more attractive animal, and, you know, he will get more service out of that horse on account of the extra care he bestows upon him, and a man will get more out of any house or piece of property he may have on account of the care given to it—he will get more real enjoyment from his home; so that I really

think that the aesthetic value attaching to property properly supplied with good pavements, which Professor Talbot has alluded to, is one which is entitled to all prominence. Take a street that has had no pavement, and put a pavement upon it, and I venture to say that fifty per cent more fixing up will take place along that street than ever was before; and with that, you will see the houses improve inside and out, and with that improvement you begin to see the children better cared for and better educated, and there is no limit to where the influences for good are going to stop. It is one of the little things we look upon as a luxury and, after all, what are we when brought down to the bare necessities of life? We can get along pretty cheaply, and some there are who have that sort of an idea of living; but these little things that serve to polish up a man and that lead him to another and higher order of things are what add to the mind and make life worth living. (Applause.)

B. F. Roberts (Des Moines, Ia.): A "piug" horse is like a vacant lot in a city where there is no pavement—it has no real, set commercial value. If a man wants to build a home, nine times out of ten, he will inquire as to facilities of gas, water and pavement, and you couldn't give him a lot out where there is not either or all three of them. Now, in the small cities (and I have lived in one), the hardest knocks come when you are getting the first three or four squares of pavement in; after that, they see the benefit of a pavement, and now, in the town to which I have special reference, with a population of eight thousand people, they have several miles of paving. Now, on the other hand, I remember in a little town in Clay County, the farmers, when they first got out that petition for a pavement, fought it with all their might; but, after hard labor, it was carried. The pavement was put in—that was not a pavement such as you see in a city, but a sort of a graveled road merely; but now there is hardly a cross-roads in the whole county that has not graveled pavements—just a matter of graveled roads. And whether it is in the city or the country, graveled roads, or brick or stone pavements, there will be found people to fight it. And it never stops, but goes right on.

President Stipes: Unfortunately, I see that Mr. Blair and Mr. Butterworth, and some of these paving brick men, have deserted us this morning.

The next thing, gentlemen, is general discussion on the subject of Paving Brick versus Asphaltum. Now, there is a chance for every one of you to gallantly defend paving brick. Mr. Barr.

C. C. Barr: I don't feel equal to assailing the asphalt side of the paving question today; but I suppose I ought to do it. I don't know how, though, and I guess I will not attempt it.

Professor Baker: I have no speech in my pocket this time. I don't know but I might say that I have considered this question a number of times, because I get a considerable number of letters asking about the relative merits of these different pavements, and I had anxiously and somewhat naturally looked forward to the discussion of the subject here for further enlightenment or suggestions upon the subject. Those questions came from the smaller cities, and I have generally answered that the brick was a good deal more profitable for paving in a small city than the asphalt, partly because a large part of the construction of the brick pavement can be done by the unskilled labor resident in the city, and partly because brick is more permanent and more durable; or, to put it the other way, because asphalt is unsuitable for our smaller cities, because a paved street is apt to be flanked by the numerous naked and unpaved streets and alleys and the virgin country roads from which the mud is conveyed to the surface of the pavement, where it sticks and accumulates; and as everyone knows who knows anything of asphalt, mud is very deleterious to it and causes it to rot, disintegrate and crumble away; and for these reasons asphalt is particularly unfavorable as a paving material in the smaller cities in a section of the country where the soil is of a nature that it forms a sticky mud at certain seasons.

Further, it seems to me, as between the small city and the large city, there is a decided disadvantage against asphalt, in that at the best asphalt must be frequently repaired and re-repaired, and to

repair it requires a skilled set of men with an elaborate outfit, and in a small city there is not any likelihood of there being enough asphalt pavement to justify the establishment and maintenance of an outfit or the employment of the separate labor to care for it; and, consequently, if a small portion of asphalt pavement were to be laid in a city it would rapidly deteriorate for lack of care which it can have in a larger city. So, that it seems to me that those two reasons are quite important as favoring brick rather than asphalt in the smaller cities.

Now, when it comes to the question of cost, that is a matter that can hardly be discussed. In general, though, I think it can be said of almost any city in Illinois that the brick pavement will cost less per square yard than the companies laying the asphalt pavement will likely charge. I do not know that I know or you know just what a fair cost for the asphalt pavement is, and we can only judge by the prices they do charge. It is true that for the sake of getting the asphalt into a city, the companies will put it down very cheaply; but, in the long run, we have to pay, eventually, in the small cities about what they have to pay in all the cities, and that price is more than for the brick pavement; and after the pavement is laid, it will deteriorate for the reasons stated. It seems to me, therefore, that there is a very decided advantage in favor of brick for paving even in considerably sized cities. (Applause.)

J. M. Mamer: I am not a manufacturer of paving brick, but still I take a great deal of interest in pavements. When I was in Buffalo, during the exposition there, (and I had heard so much about Buffalo being the finest paved city in the United States) I noticed that there were enough holes in the asphalt pavements to pretty near bury half the horses that traveled over them. Take some of our southern cities, on the other hand, as New Orleans, Mobile, San Antonio and those places, asphalt seems to stand much better. Whether the action of the frost affects the pavement in the northern cities, or what it is, is a question—but that is the conclusion I have come to. Have you, in experimentation or otherwise, ever discovered that the frosts are naturally the destructive agencies that act upon asphalt?

Professor Baker: I judge it is not a question of the frost. It would be a little difficult to tell just what it is. Whenever you come to the question of a number of pavements of different kinds, in order to make conditions upon which you can base a fair judgment, account should be taken of the degree of care it receives and the amount of traffic that goes over it; also the care that has been bestowed upon the laying of the pavement—in some cases of course more care being used than in others, which is true of all work. And right here is another argument in favor of the brick pavement, that even a layman may tell more nearly whether the brick pavement has been well laid than he can in the case of the pavement of asphalt. There is scarcely anybody except those employed by the companies laying the asphalt pavement can tell whether the asphalt is being laid properly or not, or whether the material is good or not; and even many of those employed by the companies are unable to tell definitely.

Then, there is one mixture of asphalt for the southern cities, and another for the cities of the North—graded in this manner so its resisting qualities will be adjusted to the degree of heat and changes and extremes of heat and cold it will have to encounter; and no one who has not a scientific knowledge of the subject, and an equipment of thermometrical apparatus to adjust the degree of heat at which the various asphaltum ingredients should be mixed, is capable of properly laying an asphalt pavement anywhere; so that very often the men themselves who lay the pavement may fail to get all the conditions at their proper pitch, to harmonize, as it were, and so the pavement may after all fail of its best results.

Mr. Mamer: There is a bed of asphalt rock out west of San Antonio. They dig up this rock, and crush the asphalt out of it, and obtain an excellent pavement. And there was a street in Houston that was paved with this residue, the residue of crushed rock that was left after the extraction of the asphalt. When I was there, this was an elegant street. The pavement was a first-class

one. I don't know how long it had been down, but it certainly made a pretty nice street. It is the only place I know of where they had that kind of pavement.

Professor Baker: Asphalt pavements are of two classes, natural asphalt and artificial asphalt. The natural asphalt pavement may be described in this way: There is in nature a limestone rock that is saturated with asphalt. There are great beds of this rock at different places on the face of our earth. This rock is taken from the beds, crushed, heated, and while hot, rolled into flakes under pressure. That is the natural asphalt pavement, and is the form of pavement used in Europe.

Now, the artificial asphalt pavement is when you go to the asphalt mine, several of which are found in South America and the islands of the West Indies, from which asphalt, a substance like tar, is extracted or taken. As taken from the mine it may be too thick, usually is, and must be thinned down, and the quality of the pavement depends greatly upon the material used in this thinning process; and this admixture of other material may be at too high or too low a temperature, either of which may result in a poor pavement; and quite a variety of conditions may arise in the processes of preparation, all having more or less bearing on the quality of the pavement and its wearing capacity, and the degree of service that may be had out of it.

The probabilities are that the pavements that have been referred to in these southern cities are the natural asphalt pavements. Most of the pavements in this country, however, are of the artificial variety.

The consensus of opinion and the final verdict were decidedly for the brick pavement over all other kinds, and the discussion naturally entered and centered for quite a space of time upon the next topic on the program, "What Is the Best Method of Laying the Brick at Street Intersections?" Professor Baker advocated the "Herring-Bone" form of laying at intersections, as best adapted to stand the wear and tear of travel there.

Then followed discussion on the relative merits of the different kinds of fillers used in the laying of brick pavements, advocates of sand and cement, respectively, urging their claims with about equal tenacity. The questions of what should be used for expansion joints, what distance apart and how thick received attention in this connection. Mr. Hammerschmidt advocated cement as the best filler, and had no opponents.

President Stipes: Gentlemen, one paper here, that was omitted yesterday, is upon "The Requirements of a Drain Tile Plant," by J. M. Powell, of Brooklyn, Ind. Mr. Powell has requested Mr. de Joannis to read this paper.

Mr. de Joannis: Mr. President, and gentlemen of the convention: Before I read this paper, as the time is getting short, I will have to avail myself of the opportunity right here to speak of something which should have been taken up and attended to yesterday by the Association, but which was not—that is, the subject of raising the necessary funds to meet the expenses of the Legislative Committee; so I have here several lists headed "To Members of the Association," prepared with a view to your subscribing for some contribution—nobody is allowed to put himself down for more than \$5.00, or, rather, nobody is expected to put himself down for more—and so on as the subscribing member may feel disposed, down to even \$1.00, in other words, from \$1.00 upwards. After the paper is read, these lists will be passed around to you, and they will be stubbed properly.

There is no doubt at all that this committee's hands will have to be strengthened. We are now reaping the benefit of their work, and I think you will all agree with me that these benefits justify us in taking action such as will relieve the committee, as far as may be, from embarrassment for means to meet expenses absolutely necessary. Put your name down for whatever sum you like, and we will find means of placing lists in the hands of the members who do not now happen to be here. In this way we will be able to have that Legislative Committee fund, and our committee can work without having to go and borrow money to meet their wants in the meantime.

THE REQUIREMENTS OF A MODERN DRAIN TILE PLANT.

The first requirement is a good clay or shale. I say good because good tile, like good brick, are made from good material. The shale or clay bank should be one that is thoroughly adapted to the material to be manufactured, whether it be tile, sewer pipe or brick. The clay most suitable for drain tile is one that will burn very red, and yet be very hard and tough, without discoloration caused from hard burning or other conditions in the kiln that gives a non-uniform appearance to the tile. Red tile are generally liked best. A good drain tile clay should be one that will shrink as little as possible in drying and burning, as tile made from clay with little shrinkage will not crack in drying, will hold their shape better in burning and always remain rounder than those that shrink more. The clay that we are using at Brooklyn shrinks less than five-eighths of an inch to the foot when burned to partial vitrification. Further, a good shale bank is one that is uniform throughout in texture, each stratum burning about the same color with an even shrinkage, also one that lies above the water level and that can be drained without pumping. A good clay or shale bank is not easily found. I you should start to find a good clay bank and should succeed in finding one that you think would do, when you attempt to buy it and the owner finds that you want to build a tile or brick plant, that particular piece of land usually becomes very valuable notwithstanding it may be listed for taxation at \$10.00 per acre.

Second, as to the cheapest and best way of digging and hauling the clay to the plant.

Shales are usually dug by blasting, then shovelling to the car and although this is probably the cheapest in small plants, steam shovels are preferable where the quantity of clay used will justify its operation. The clay may be hauled in cars pulled by a winding drum and wire cable but I think an electric haulage would be preferable at plants where power may be had and where the grade is not too great. The car may be started from the bank by simply setting it in motion and traveling the distance to the plant and back again without an attendant, except to dump the car, thus saving the expense of a man to operate the winding drum.

Third. The clay car should enter the building at the second story so as to have it as far above the dry pan as possible and should be arranged to dump either to right or left. The clay bin should be at least 16x20x12 ft. Through the center of the clay bin, and just beneath the floor, place a belt conveyor across which a false floor or loose boards should be laid. By removing these boards when the bin is full, or partly so, the clay will roll to the elevator by its own weight, the elevator carrying it to the dry pan. With this arrangement one man can grind as much clay as three men could shovel. Then the work is easy for them and he is always better satisfied. A satisfied employe is always the best man.

Fourth. From the dry pan the clay is elevated in a bucket elevator to the top of the third floor and there passed to some good screen. The clay should be screened fine for drain tile. From the screen the clay should fall into a large storage bin something like 16x30x15 ft. A bin of this size will hold clay enough for two or more days' run. It pays to have plenty of clay in the shed for a rainy day. Beneath the floor of this bin may be placed a heavy sprocket chain driven from the lower end of the bucket elevator, so that when the elevator stops, the chain will stop. The purpose of this chain is to drag the ground clay into the elevator boot. A false floor is laid over the trough in which this sprocket chain runs. By removing portions of this false floor, the clay flows on to the sprocket chain and is carried to the elevator, and will require but little attention. One of the advantages of this plan is that of using a gate, which gages the stream of clay to the required amount.

Fifth. The clay next passes to the pugmill. This is an im-

portant stage of the manufacture. The pugmill should be large and heavy so that the clay may be thoroughly and uniformly mixed. The pugmill should be located on the third floor so that the prepared clay can be passed through shoots to the tile mill or steam press, as it is best to make the larger size tile on a press.

The shoots should be so arranged that the press and mill can be run at the same time or separately. This may be done by a little gate or switch at the end of the pugmill. It is best to put the heaviest and best machinery that it is possible to get as the best is none too good.

Sixth. A steam boiler and engine should be of the best, as well as all other machinery and appliances that are used.

Seventh. The tile should be handled as little as possible while in their green state; therefore, we have arranged to dry our tile on cars and tunnel driers. The cars are 4x8 ft. The tile are set on the cars two deep, the large tile being one length set on pallets. The drier cars are carried on a transfer car to the tunnel drier and pass through the drier in two days, which will dry them thoroughly. From here the cars are again placed on a transfer car and carried to a track that leads to the entrance of each kiln. From here they are carried by a special truck to the interior and the dry tile are set in the kiln and the drier cars return again to the press. We cannot say that this plan is particularly new or modern, it having been borrowed from the brickmaker but it does save two handlings of the tile just at a time when they are most liable to damage.

Eighth. As to the kilns, there are many kinds in use, a round down-draft being the most used. We are using the Youngren continuous kiln, having 12 chambers, 16x30 ft., and set our tile 12 ft. high. Some of the advantages of the continuous kiln are: first, that the fuel is used at one place. The coal is wheeled and dumped into the gas producer, which is located at one end of the kiln and here it is made into gas and carried by a flue to all the 12 chambers and admitted into them as required. It is very easy to operate. The gas is under perfect control of the firemen. The kiln is so built that the whole fire line is always in view. The kiln is entirely covered by roof, also the setting and draining gang are under shelter while at work. While the first cost of the kiln is more, it is a great pleasure to have the plant neat and compact where it can always be kept clean, there being no coal and cinders except at the one place, namely the producer. Then it is possible to have good concrete runs over which the tile may be carried to the cars. The continuous kiln may not be so modern, as I am told it has been in use for many years in Europe, but in this country it is comparatively new. However, I think it is here to stay for it burns the ware all right, more uniformly than any other kiln that I have ever seen. As before stated, the first cost is, of course, considerably more but there is a saving in fuel and it is easier to operate, cleaner and more compact. When we began building this plant and it became known that we were to build the continuous kiln, some said, "Now, Powell, look out." Others said that they would rather it was us than they; others told little stories of some adventurous men and how they failed; others wanted to know if it had ever been tried for tile. But we proceeded to build both the kiln and the tunnel drier and we are not sorry.

Ninth. We do not claim that our plant is particularly new or modern, but for one thing, we have tried to build it of the best material and as near fireproof as possible. We have also sought to make every move count; that is, to start the tile when made toward the market, keep on moving in that direction and yet handle it the fewest number of times and carry it the shortest distance. This we have accomplished in a large measure.

President Stipes: Gentlemen, I believe we have hardly time to discuss this paper. I regard it as a very good one.

The next in order is the report of the committee on resolutions.

REPORT OF COMMITTEE ON RESOLUTIONS.

Whereas, this year it has been demonstrated that circumstances may conspire to prevent the holding of our convention at the time provided for in our by-laws, therefore be it

Resolved, That such by-law be hereby rescinded, and that hereafter we meet at the call of the executive committee.

Whereas, the funds of the association do not warrant the expense of an official report, therefore be it

Resolved, That the motion providing for an annual stenographic report of our proceedings by Miss A. Wallace be rescinded, and that hereafter the report be left to the efficient handling by the respective trade journals.

Whereas, the twenty-eighth annual convention of this association has again met in Champaign, with a 20 per cent increase of membership, and,

Whereas, there is a marked improvement in the quality of the work done by this convention which will result in great benefit to the clayworkers of the state; and,

Whereas, the hospitality enjoyed by us exceeded even that of last year, therefore be it

Resolved, That the thanks of this association be accorded to our hosts of Champaign and Urbana, who have contributed so much to our mental development and enjoyment and our physical welfare. Among these we mention prominently the professors of the university, whose labors in our behalf we appreciate more and more each year:

Resolved, That we convey our sense of appreciation to C. B. Hatch, "mine host of the Beardsley," for his general good will toward the association, his well-ordered banquet, and his splendid orchestra as provided especially for our benefit and enjoyment.

Resolved, That we sincerely appreciate the splendid work of our officers during the past year, culminating in this record-breaking convention.

Resolved, That this association desires to express its deep sense of obligation to the members of the legislative committee, and also Prof. C. W. Rolfe for their untiring efforts and self-sacrifice shown in their work of securing the passage of the bill which gave to Illinois a clayworking school.

J. M. MAMER,
HARRY DE JOANNIS,
H. E. SHAW,

Committee on Resolutions.

Warren W. Ittner: Mr. President, I move for the adoption of the resolutions as read.

T. A. Randall: I wish to say a word in regard to the pay of the stenographer. I think there has been some misapprehension here in this connection; I know there was last year.

The matter of paying Miss Wallace for the stenographic report was not connived at either by herself or myself—we never connived at, never even suggested it. It was done by your own former secretary, as he understood it, as he desired it; and I repeat that neither Miss Wallace nor myself has ever asked for, intimated or suggested any action of that sort, and if when the matter was up last year, some one had suggested it and a similar resolution had been introduced, I should have favored it.

I did object to an official of this organization doing what the organization itself had not authorized—any member or members of the organization violating the express order of the organization. I did not object to waiving the pay of the stenographer—did not require that at all—and I want to say here that not a penny of what was paid to Miss Wallace ever went to my firm directly or indirectly—that it went to her wholly and absolutely. I want the members to understand that the resolution in question I have no objection to whatever, being introduced as it is in a proper and business-like way, that is, in the general way.

The other proposition was right along the same line. This organization had a fixed date of meeting. No officer or officers of the Association had any authority whatever to change that day. Now,

that was not personal to me, had nothing to do with my personal convenience or my ability or inability to go to attend; I could not have gone to Iowa if the meeting had been called at the usual time, so that it is not a matter of personal feeling to me. This organization is a business organization, and should be governed by its own actions which the officers have no authority to usurp. They have no authority to subvert or go contrary to the rules of the organization. There is a straightforward, frank and business-like way of doing things, to which I think these resolutions agree, and I second the motion for their adoption.

Martin W. Lauer: Mr. President, I am a new member of this organization. This is the second meeting I have attended. I have attended meetings of a great many organizations. The only way in which we can judge of an organization, as to whether or not it is a business organization, is by ascertaining whether or not its actions and affairs are conducted along business lines, and this may be observed to the best advantage, perhaps by the new members who have just come in. And being here present as a new member, I want to testify that it is my firm belief and conviction that this organization has been conducted strictly along business lines; and I want to compliment the officers of last year and officers of this year for the business-like manner in which they have conducted the affairs of the Association; I move for the adoption of their report.

Harry de Joannis: I second the motion.

President Stipes: Just a word here, in regard to the Executive Committee changing that date. You see, our date conflicted with that of the Iowa Association, that is, we were a little slow in getting at our date, and Iowa took it; and it being a little inconvenient for both organizations to meet at the same time, it was thought best to change our date to the next week. Previous to that, we had canvassed to see where we would hold the meeting, and had decided to come back to Champaign; then, when selecting the time, we came into collision with Iowa, and fixed upon the following week, to a date that we thought would give the machine men time to get here; and when the committee came here, it was found that the hall was already occupied for the time, and so we took the date nearest to the one we had selected before. I for one was ignorant of the existence of any law that we were stumbling over; and while grateful for the information in regard to legal trespassing, and acknowledging our indebtedness to Mr. Randall for enlightenment on these points, I am glad it has turned out all right, and happy to have escaped with so slight a censure.

It has been moved and seconded that the resolutions as read be adopted: All in favor of the motion will signify their assent by saying, "Aye;" contrary, "No." Carried.

The report of the treasurer, Mr. William Hammerschmidt, was read by him as follows:

TREASURER'S REPORT.

Jan. 10, 1905, balance on hand.....	\$ 56.33
Received by Secretary Hartwell in 1905.....	7.00
Jan. 25, dues for 1906.....	124.00
	\$187.33

Disbursements.

Stationery	\$ 8.75
Postage	14.00
Badges	16.75
Programs, postal cards, blanks, etc.....	17.50
Expense in arranging meeting.....	27.46
Secretary's fee	15.00
	119.46

Balance on hand in February\$ 67.87

Mr. Randall: I move for the adoption of this report, and that it be placed upon record. And I wish to say in this connection, with regard to the handling of the finances, and Mr. de Joannis' proposition to hand around a subscription list, that I am opposed to subscription lists, and think that they ought not to be resorted to unnecessarily; and right here, again I will say that our business matters should be governed and carried on along business lines and business principles, instead of appealing to the generosity and good

nature of individual members, trusting to them to go down into their pockets for the amount of a subscription. If our dues are not sufficient, I would advocate an increase in the amount of dues. I believe that to be the most rational way of going about it, and I make a motion that the matter be referred to a committee with instructions to report at the next convention, and in the meantime that the members of the executive committee be authorized to make any expenditures necessary. You can trust your executive committee; and I believe that to be the more rational and wiser course to take in that connection; or, appoint a committee to take up ways and means, see if the dues are sufficient, and if not, raise the dues.

Mr. Lauer: Mr. President, I rise to a point of order. There is a motion before the house; that motion should be disposed of. After that, this can be taken up and disposed of. The motion that, I believe, is properly before the house, is that the report of the treasurer be adopted and placed on record.

Mr. Randall: I beg pardon. I made the motion, I believe, and I thought some one had seconded it.

Mr. Lauer. I move for the adoption of the report just read by the treasurer, and that it be placed on record.

Motion seconded and carried.

Mr. Randall: Now, I make that motion—that there be appointed a committee on ways and means to canvass the question of raising funds, whether by increase of dues or otherwise, and that in the meantime the executive committee be authorized to defray any expenses necessary in this matter.

C. C. Barr: I second that motion.

J. M. Mamer: The executive committee ought to handle that—

Mr. de Joannis: Let us hear from one of the executive committee, as to whether there is any money.

Mr. Hammerschmidt: We need money for the next meeting, of course. We should be put in position to go ahead with our next meeting, if we want to force this appropriation; and we want to be there from the first day to the last day—anything to make it a success, I don't care how.

Mr. Randall: The dues of this organization are nominal—always have been, and should be fixed and regulated by the needs of the organization as determined by its executive committee; if more means are needed, raise the dues.

Mr. de Joannis: I will add, specially, that this fund is only to be temporary. The object to be kept in view is to get an appropriation from the legislature. We have not yet accomplished what we set out to do last year, for we have only a small slice; consequently the work of the legislative committee is not yet completed, and they are going to start in this year, which will entail more expense; and the fund we want is only temporary.

President Stipes: I believe the motion has been made and seconded—it is moved and seconded that a committee of three be appointed to find ways and—

Mr. Randall: Committee on Ways and Means to canvass the matter of the advisability of raising dues, to be determined at the next convention.

Mr. J. M. Mamer: I would make an amendment to that motion,—that the executive committee be that committee on Ways and Means also.

Mr. de Joannis: I second that motion.

President Stipes: Now, gentlemen, you have heard the motion for the appointment of the committee. All in favor of that motion will signify their assent by saying, "Aye;" contrary, "No." Carried.

President Stipes: That applies to the original motion. Now, the amendment to the motion which you have heard, gentlemen—all in favor of the motion as amended, say "Aye;" contrary, "No."

President Stipes: Ayes have it. The motion as amended, having been thus submitted to the meeting, is duly carried in the affirmative.

Mr. Randall: If there is a stenographic report made, I think it will show that the negative vote was not taken on the amendment. I don't think, however, that anybody is going to quarrel about it—the original motion was amended, and no negative vote

was taken on that. I don't care how it goes, but I think that that is rational.

Mr. Mamer: I supposed, for one, that it was put both times in the same way; if there was any difference, it was an oversight, and I don't see that it will signify.

Mr. Randall: I will say this, so that the matter may come up now: On the executive committee are the officers; nearly always, the vice-president is selected simply because he is an officer, and perhaps he may never have attended a previous convention, and I believe the committee should be appointed by the chair from among the older members, like Dr. Converse, Mr. Gates and Mr. Hammerschmidt, who are older members—

Dr. Converse: Has not the original motion been moved, seconded and carried? And then the original motion was amended and as amended was voted on, for and against, and carried?

Mr. Randall: It was not voted against; the negative vote was not taken. I believe it is all right as it is, though.

President Stipes: If that is agreeable, we will do it—let it stand as it has been done. Doctor, I am glad you helped us out there.

Let us now proceed to the election of officers.

Mr. Hammerschmidt: Gentlemen, I rise to put in nomination for president for the next year, a man that you all know, who handles this body well and who has worked well; and I move that the rules be suspended, and that the secretary of this association be instructed to cast the ballot for this entire convention, for John W. Stipes, of Champaign, for president of the association for the coming year.

Mr. de Joannis: I second the motion.

Mr. Hammerschmidt: I will put this motion for you—Gentlemen, all those in favor of the secretary casting the ballot of the convention for John W. Stipes as president say "Aye;" contrary, "No." Motion carried.

Secretary Hartwell: The vote is so cast; John W. Stipes is elected to the office of president for the ensuing year.

Mr. Randall: I presume the next in order is the election of a vice-president; and I think it is well when you get a good man, and he is found to be an earnest, able worker, it is well to pull him up to the front, and I would like to name Mr. A. W. Gates, of Monmouth, Illinois, for vice-president.

The nomination of Mr. A. W. Gates was duly seconded. The motion of nomination, calling for the casting of the unanimous vote of the convention by the secretary, was duly submitted and carried.

Secretary Hartwell: The vote is so cast.

Mr. A. W. Gates, of Monmouth, is elected to the office of vice-president of the association for the ensuing year.

Mr. J. M. Mamer: I arise to nominate and move that the rules of this association be suspended, and that John W. Stipes be instructed to cast the ballot of this association for the election of Mr. George H. Hartwell, Chicago, as secretary.

Mr. de Joannis: I second the motion.

President Stipes: Gentlemen, you have heard the motion and the second of it. All in favor of it say "Aye;" contrary, "No." The "ayes" have it. Geo. H. Hartwell, of Chicago, is elected secretary of your association for the ensuing year.

Martin W. Lauer: I wish to nominate Mr. William Hammerschmidt for the office of treasurer for the ensuing year, and move that the election be by acclamation. Said motion was duly seconded and carried.

On motion of Mr. Mamer, seconded by Dr. Converse, the meeting was adjourned, to meet again at the call of the Executive Committee.

Garland & Weaver, Knoxville, Tenn., have bought 30 acres of land near Eden in the twelfth district and will at once erect a large brick plant. The firm now operates a plant at Proctor, but the supply of clay is being exhausted.

PURINGTON YARDS TO BE IMPROVED.

Improvements on a large scale are in progress at the Purington Paving Brick Co.'s yards at Galesburg, Ill., at present, and will be continued for some time. While no definite figure is placed upon the cost of the additions and changes, they are the most extensive in the history of the great plant.

At Yard No. 1 the transfer track has been changed the entire length of the yard, making room for wheeling and loading without interfering with transferring the green brick from the dryers to the kilns; also increasing the convenience of loading brick by running a stub switch track on the south side of the kiln. The company did the excavating and the Burlington laid the track.

At Yard No. 2 a soft coal gas producer has been purchased and will be constructed at once for supplying coal gas for burning the brick.

At Yard No. 3 a new tubular boiler, 150 horse-power capacity, is being installed, thereby materially increasing the capacity of the plant.

At Yard No. 4 no new machinery is being installed, but all of the yards have been thoroughly overhauled. Most of the machinery has been reset on brick supports, instead of wood. This plan is a permanent one, as good brick, laid in cement, will last indefinitely.

Since the recent fire at Yard No. 2 the company has decided to make the yards more fire-proof by running brick walls through the buildings, making them into compartments instead of one large room; also by increasing the capacity of their compound Duplex fire pump one-fourth. This pump is located at Yard No. 1 and is used exclusively for fire protection and hydraulic stripping and is under pressure constantly. The yards are all connected by telephone. The company has recently placed a man in the general office at night. The foreman of the different departments at the different yards have to report at stated intervals during the night by telephone.

A further improvement is making a reservoir between Yards No. 1 and 4, which has already been begun.

Last, but not least, the company has their own machine, blacksmith and carpenter shop, where the repairs for all the yards are made. The wheelbarrows and clay cars are all made in this shop. Godfrey Swanson has charge of this department.

The repairing is all nearing completion and it is expected that the work will all be done by the time the new steam shovel arrives. Barring a coal strike, the first of April will find the brick yards all in operation.

ANOTHER PAMPHLET.

Another pamphlet is presented lately to the public by the New York Blower Company, 25th place and Stewart avenue, Chicago. It is numbered 63 and shows the different styles of engines used for driving fans, either direct connected or belted.

The publication is tastefully gotten up and is full of information. It may be had by application to the New York Blower Company's office.

BRICK COMPANIES HAVE EFFECTED A COMBINATION.

Merger has been effected by the combination of six brick manufacturing companies in the vicinity of Wilkesbarre, Pa., which will practically give to the Wyoming Valley Brick Manufacturing Company control of the brick-making business between Honesdale and Brandt, a stretch of seventy miles, and it will be by far the largest brick business in Northeastern Pennsylvania, for it is believed that eventually three more brick industries can be bought.

The Wyoming Valley Brick Manufacturing Company is financed by Scranton, Pittston, Brandt and Wilkesbarre men, having for president Mathias Stipp, the well-known contractor and brick maker of Scranton. Thomas A. Dunn of Wilkesbarre is treasurer. The directors are Louis Tisch, Attorney John T. Lenahan, Attorneys Frank W. Larned and A. H. Bloom, all of Wilkesbarre, and J. H. Bryden of Pittston.

The entire bond issue is for \$350,000, and \$250,000 of these bonds were issued by the Wyoming Valley Brick Manufacturing Company to the stockholders and individual owners for six brick plants located in Wilkesbarre, Scranton, Pittston and Brandt, Pa. The six brick plants have a capacity of fifty million brick per annum, and there is a market in the Wyoming Valley for 25,000,000 per annum. It has been demonstrated by actual experience that a net profit of \$3 per thousand can be made, which will yield a net profit of \$75,000 per annum, or equal to 12 per cent on a capital stock of \$500,000, after interest charges of \$17,500 have been deducted on \$350,000 of bonds, which is triple the interest charges on the bonded indebtedness. It is announced that \$100,000 of the bonds are to be sold at once for the purpose of improving the different plants and working capital, and the balance to purchase six brick plants.

This company has two hundred acres of the finest land, which will last the company at least one hundred years. There will also be a sinking fund set aside for at least \$15,000 a year, to take care of the bonds at their maturity. The company offers these bonds at par, \$100 and interest, and also gives fifty per cent of stock as a bonus.

REESE-HAMMOND FIRE BRICK COMPANY OF BOLIVAR HAS LIQUIDATED ALL OF ITS INDEBTEDNESS.

In Prothonotary Null's office at Greensburg, Pa., there was filed an application for the discharge of the Westmoreland Savings & Trust Company of Greensburg as assignee for E. R. Hammond, B. F. Reese, James B. Hammond and James Hammond, comprising the Reese-Hammond Fire Brick Company, of Bolivar, one of the biggest brick concerns in the country.

It will be remembered that during litigation the company assigned several years ago, but the big plant was kept in operation by the management and now the company has liquidated all indebtedness and is prepared to enter the brick field on a larger scale than ever. The company is in excellent shape and through careful management every cent of indebtedness has been wiped out.

WILL DISCUSS A SHORTER DAY.

Notice of a desire for a conference for the purpose of agreeing upon a schedule of hours, wages, etc., has been issued to the manufacturers of brick, tile and terra cotta in Northern California by the State Building Trades Council.

The conference is designed particularly to deal with the question of change from a ten-hour to a nine-hour work day. It does not include Southern California, since the nine-hour day in this trade is already established there. And no trouble is expected over the matter, as it has been more or less informally discussed, and some of the most important firms in Northern California, notably at Carnegie and Tesla, have already signified their willingness to agree to the change. No date has been set for the conference, though it is expected that it will occur within thirty days.

The following is an almost complete list of the firms affected and asked to participate in the conference:

Golden Gate Brick Company, Holland Sand-stone and Brick Co., both at Antioch; Gladding, McBean & Co., Lincoln; San Jose Brick Co., Remillard Brick Co., San Jose; Remilliard Brick Co., at Green Brae; Oakland Art Pottery, California Pottery Co., Rose Fire Brick Co., Oakland; N. Clark & Sons, Alameda; Carnegie Brick & Pottery Co., factories at Tesla and Carnegie; Gray Brothers, Simmons & Fought, Bay City Brick Co., Steiger Pottery Company, South Sanara; San Francisco; Steiger Brick Co., South San Francisco; Stockton Brick & Pottery Co., Stockton; Thomas Butler, Baden; Fresno Brick and Tile Co., Fresno; California Brick & Pottery Co., Glen Ellen; Port Costa Brick Works, Port Costa; Patent Brick Yard, San Rafael; two at Point Richmond.

INDEPENDENT FIRE BRICK PLANTS MAY BE CONSOLIDATED.

Arrangements are being completed for the consolidation of sixty of the largest independent fire brick manufactories in the country under a holdings company, to be known as the American Refractories Co., which is to have a capitalization of about \$12,000,000, and which will represent at its inception at least 90 per cent of the independent interests in the country. The output of the proposed consolidation will not be less than 1,500,000 bricks daily.

The purpose of consolidation is said to be to improve the present condition of the trade and the existing low prices for fire and silica brick. The principal interest in the trade at this time is the Harbison-Walker Refractories Co., which is capitalized at \$27,600,000, of which \$18,000,000 is common stock. The output of this company is said to be 1,000,000 bricks daily. It is said that the consolidation of the independent interests is looked upon with favor by Harbison-Walker interests for the reason that price-cutting, which has been rampant among the independents, will in great measure be eliminated. While negotiations pointing to the proposed consolidation of the independent interests involved but sixty plants at this time, it is believed that all desirable independent interests, and there are not many more, will be included in the merger before it is finally completed.

CLAY IN THE KENOVA QUADRANGLE.

While studying the areal geology of the Kenova quadrangle last summer, Mr. W. C. Phalen of the United States Geological Survey made some interesting observations concerning deposits of fire clay in that area. The name "Kenova," plundred from parts of the State names Kentucky, Ohio, and Virginia, has been given to a town situated in West Virginia, at the confluence of the Ohio and Big Sandy rivers. It is this town which gives its name to the thirty-minute quadrangle lying, for the most part, in northeastern Kentucky and including small parts of Lawrence County, Ohio, and Wayne County, W. Va., which members of the Survey have mapped.

This area has long been noted for its extensive resources of iron ore, coal, and fire clay. Since the discovery of the cheaper Alabama and Michigan ores the iron of this region has ceased to be exported and the old charcoal furnaces which dot the surface of the country have fallen into disuse.

The geologic structure of the region is such that the valuable coal and fireclay beds which distinguish it are well distributed throughout the quadrangle. Nearly all the coals have varying thicknesses of clay associated with them. In some cases these have proved thick enough to be of value when exploited with the coal. This is the case with the fire clay that lies in and below the two benches of sub-Homewood coal and is worked by the O'Kelly Fire Brick Company, in the eastern part of the town of Ashland.

By far the most important fire clays are those associated with the Ferriferous limestone and overlying the sub-Carboniferous limestone. These are now worked near Coal Grove, Ohio, (opposite Ashland, Ky.), by the Petersburg Firebrick and Tile Company and also at the western edge of Ashland itself by the Ashland Fire Brick Company. Farther up the Ohio River, on the Ashland-Catlettsburg pike, it is used by the Weaver Pottery Company in making pottery, and seems to give very satisfactory results now that means have been devised for removing the tiny pellets of limestone with which it is contaminated. At all of these points the clay shows a good workable thickness. A typical section is at the Johnson opening, in West Ashland, where a 6-foot bed of clay shows 4 feet of dark gray fire clay, 6 inches of limestone ore, and 2 feet of light drab fire clay. The limestone ore is not always present and in this position.

At Willard and, according to report, south of Cassville, W. Va., the clay has no partings at all. At Cassville the thickness varies from 3 to 9 feet, homogeneous throughout. At the Willard openings the thickness of the clay varies from 5 to 6 feet, the lower 2 feet, which are lighter in color and harder, being considered an excellent plastic clay, superior to the overlying four feet.

The clay of this horizon is generally plastic. In making fire brick this clay is always mixed with a non-plastic flint clay, the proportions used varying with the quality of brick desired. For the manufacture of a second grade fire brick from 65 to 80 per cent of the plastic clay is ordinarily used

and from 35 to 20 per cent of flint clay. There is usually associated with the plastic clay horizon a very thin band of flint clay which is admirable as to quality but too thin to be of economic importance. The greatest thickness of this flint clay is shown at Willard, where it is about 12 inches thick and lies about 10 feet below the main body of fire clay.

The Olive Hill fire clay lies just above the sub-Carboniferous limestone and is identical with the flint clay that occurs in the western portion of the Kenova area. Thus far it has not been exploited in a large way. This fire clay horizon, as shown by the Olive Hill section, is in many respects very remarkable, attaining in some places a thickness of 15 feet. The section at Olive Hill exhibits four distinct types of clay, which usually occur in a definite order and are usually capped by a small seam of coal.

Besides the regular Carboniferous clays along the Ohio River, the pleistocene clays of the Ohio flood plains are extensively used at present in making a good grade of red building brick. A short distance west of Ashland the Means Russell Iron Company operates a plant which has a capacity of 20,000 brick a day, while in the eastern part of the town the J. J. Gates Company and the O'Kelly Fire Brick Company are utilizing material brought from the same source. Many of the flood-plain deposits contain valuable brick clay, and only a relatively small portion of it has thus far been used.

SPRINGFIELD MANUFACTURER ARRANGES TO MAKE SMALL BRICK.

Perhaps one of the best known and best advertised brick yards in Minnesota is the Springfield yard owned by A. C. Ochs, and still he is not satisfied with the reputation he has for the manufacture of brick, and is arranging to further advertise his business by the manufacture of a souvenir to be given to his customers in the shape of a small brick made to imitate the popular domino.

In speaking of the venture the Springfield Advance of last week has the following:

"On the one side will be the domino, while the other side will contain the manufacturer's name.

"The souvenir idea is an original one, and the machine was purchased of and made to order by the Illinois Supply and Construction Company, St. Louis, Mo.

"Just as soon as the weather will permit of digging the clay, which must of necessity be a certain quality, Mr. Ochs will put a force of men to work on the manufacture of these little souvenirs. They will be supplied to the numerous customers in Minnesota, Iowa and the Dakotas."

WILL USE ELECTRIC POWER.

The American Brick and Tile Company, Oklahoma City, Okla., has installed an electric motor to furnish power to run their machinery to take the place of steam power, and owing to the heavy demand for brick have placed a large order for machinery, some of which has already arrived. This will double their present capacity, and the company will shortly be able to turn out 1,000,000 brick per month.

WEST VIRGINIA SILICA BLOCK COMPANY.

The West Virginia Silica Block Company, of Wheeling, W. Va., has, on the 12th inst., closed a deal for a forty-acre tract, which contains a hill composed of the very purest silica sand rock, the analysis of which shows an average of about 99¾ per cent silica. This company intends marketing this to such manufacturers who require high-grade sand, besides using it in their own manufacture of the finest grade of fire brick, as well as enameled and glazed brick, for which purpose this sand-lime brick is admirably suited. The intention of the company is, also, to make a very high-class second-quality fire brick of this sand, such as will stand a heat of 2,800 degrees Fahr. This glass-sand property is located close to Brinkhaven, Ohio, a junction between C. A. & C. R. R. and the Coshocton-Mansfield branch of the Pennsylvania lines, and the freight rates to Pittsburg districts from there are practically the same as from Wheeling, besides there are other large market centers at closer range.

The intention of this company is to, later on, build another works along the Ohio river, not far from Wheeling, where good river sand is found, thus eliminating or lessening freight rates on bricks made of such sand, which bricks will naturally not be of such high order as those made at Brinkhaven, but still of such quality as will compete with the very best re-pressed clay and vitrified brick.

This company anticipates a very prosperous future, as they will manufacture this superior brick at no more cost, rather quite a lesser cost, than the cheapest clay bricks can be made for. This is mainly on account of fuel saving and partly on account of the automatic method of manufacture, requiring very little labor in comparison with the output. Besides they expect a still more improved quality of brick from a special machine which Mr. Emil Hallgren, the company's manager and acting president, has under way to completion, and which promises to cheapen the brick-making as well as improving it. This machine can be used in making roofing tiles, sills, lintels, jambs, gutters, curbstones, as well as a great many products in the pottery line, for which this silica sand is well adapted.

This company was incorporated September 8th, 1905, under the laws of West Virginia, with authorized capital stock of \$100,000. While only about one-half of this amount will be used in the beginning of business, it was thought proper to prepare for the future enlargements of the company's properties.

H. BREWER & CO.'S 1906 CATALOGUE.

This well known Tecumseh, Michigan, firm is now issuing its forty-seventh annual catalogue. They were established in 1849.

The new catalogue contains over 100 pages, describing nearly all the machinery, illustrating and giving specifications of same. The introductory is very brief. It is followed by a guarantee, which is, "Satisfaction or no sale." Then hikes right into describing the new No. 25 Horizontal Brick Machine, and from that down to the smallest supply.

Write at once and get a copy if you are interested in brick or tile making.

CONDITION OF THE FIRE BRICK TRADE AT PITTSBURG.

The Harrison-Walker Refractories Company, of Pittsburg, Pa., manufacturers of highest grade fire clay, silica, chrome, magnesite brick, importers and shippers of grain magnesite, magnesite cement, chrome ore, etc., reports that during the past two months they were in receipt of the following interesting orders and contracts:

Bethlehem Steel Company, South Bethlehem, Pa.—Orders for all refractory materials required for new open hearth furnace construction and two new blast furnaces, eight new stoves, connections, etc.

New Jersey Zinc Company, Palmerton, N. J.—All fire brick required for new blast furnace and four stoves, connections, etc.

Milliken Brothers, Mariner's Harbor, Staten Island, N. Y.—Entire requirements of refractory material for five new basic open hearth furnaces, soaking pits, heating furnaces, gas producers, etc.

New York State Steel Company, Buffalo, N. Y.—Entire requirements of refractory materials for two 200 ton "Talbot" furnaces, with accompanying soaking pits, gas producers, boiler settings, etc.

Colonial Iron Company, Riddlesburg, Pa.—Complete blast furnace lining.

Dunbar Furnace Company, Dunbar, Pa.—Complete furnace lining and all brick required for one new stove.

Central Iron & Steel Company, Harrisburg, Pa.—Complete lining for blast furnace.

Colorado Fuel & Iron Company, Pueblo, Colo.—All brick required for blast furnace lining.

Marietta Glass Company, Indianapolis, Ind.—One of the largest orders for glass furnace construction ever placed.

H. C. Frick Coke Company.—All brick required for 264 Bee Hive ovens.

Republic Iron & Steel Company.—All brick required for 100 Bee Hive ovens.

Washington Coal and Coke Company.—One million brick.

Copper Queen Mining Company, Dawson, New Mexico.—400,000 brick for coke ovens.

Hostetter Connellsville Coal & Coke Company.—500,000 brick.

National Cement Company, Eastern New Jersey.—All brick required for lengthening 16 kilns, etc., etc.

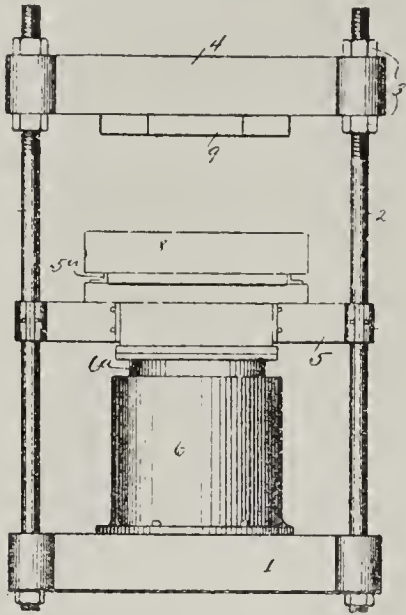
Regular trade customers are ordering in larger quantities than ever before and new customers for refractory material are constantly coming forward.

The high pressure at which industrial establishments are being operated shows no signs of abatement; in fact, the insistent demand is increasing month by month as shown by the fact that the orders received in February are 25 per cent larger in tonnage than those received in January and nearly double the tonnage in September, 1905. February orders were the largest ever received in the history of the Refractories Company during the past four years, and those received to date, in March, are in excess of those received for a corresponding period in February.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

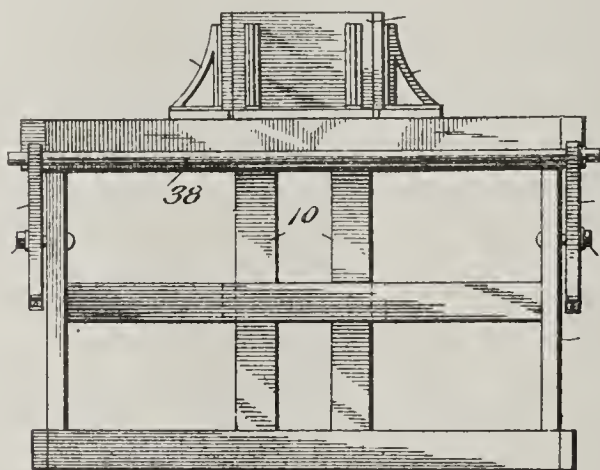
These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

809,251. Cement-Tile Machine. Fred B. Dysart, Superior, Nebr., assignor of two-thirds to C. E. Adams and A. C. Felt, Superior, Neb. Filed August 18, 1905. Serial No. 274,736.



Claim.—In a machine of the class described, a base having vertical shafts secured therein, a header-plate adjustably mounted on the upper part of said shafts, and means for locking said header in its adjusted position; a bed-plate slidably mounted on said shafts, a mold-box secured to said bed-plate with a space between said box and said bed-plate, pallets slidably arranged in the space between the mold-box and the bed-plate, and a mold-box having hinged ends, and means for operating said bed-plate, all substantially as described.

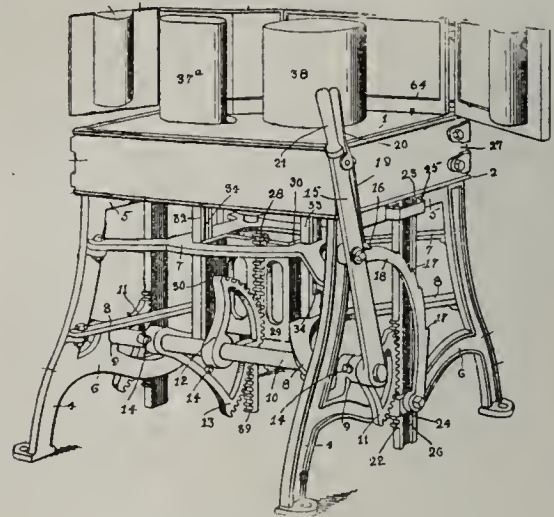
810,300.—Machine for making Blocks or Tiles. Daniel I. Pettit and John E. Pettit, Grand Junction, Iowa. Filed March 11, 1905. Serial No. 249,619.



Claim.—In a block or tile making machine, the combination of a frame, a table vertically movable in said frame and provided with guide-slots, a mold bottom board supported upon the frame, adjustable side boards carried by the table, carriers to which said side boards are removably attached, an eccentric-head disposed below and carried by the table, radial bars or links connected at their inner ends with said head, fastenings sliding in said guide-slots and adjustably connecting the outer ends of the links with the carriers, a lever for operating the eccentric-head, and means for raising and lowering the table.

810,025.—Machine for Molding Concrete Blocks. Walter G. Bennett and John F. Seyfang, Toledo, Ohio. Filed Aug. 3, 1905. Serial No. 272,522.

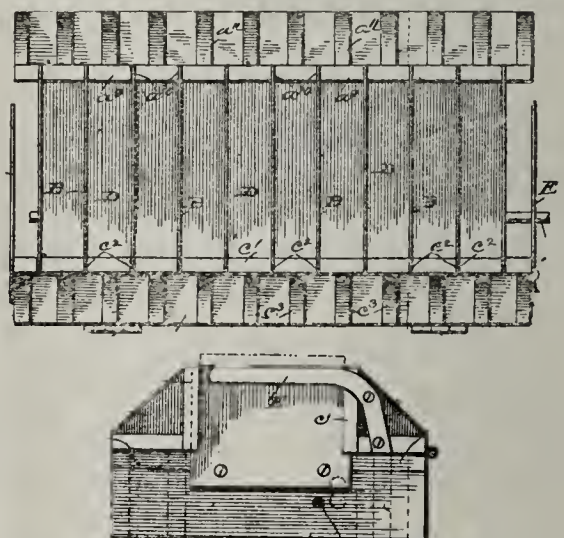
Claim.—In a machine for molding concrete blocks, the combination with a mold-table having openings for the pro-



jection of cores above the table from beneath, of cores for the openings, an articulated mold adapted to surround one or more of the core-openings, means to project the cores singly or collectively through their respective openings into the mold, and to withdraw them therefrom, substantially as set forth.

811,518.—Brick Machine. Oliver Nolan, Minneapolis, Minn. Filed July 27, 1905. Serial No. 271,440.

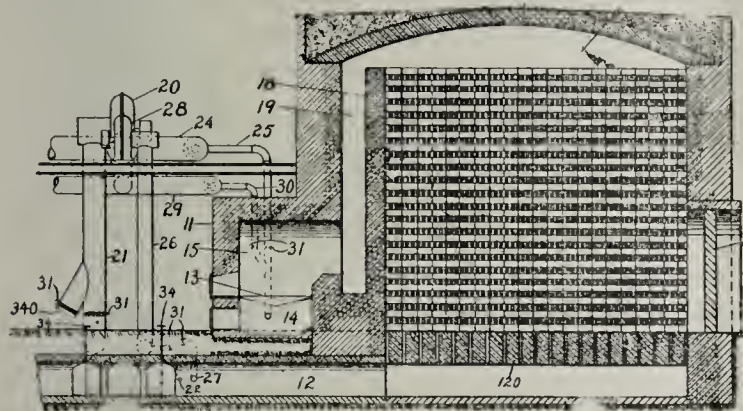
Claim.—In a brick-machine, the combination of a base, comprising pairs of longitudinal stringers spaced apart, cross-bars connecting the ends of the stringers, a horizontal plate resting upon the rear pair of stringers, and provided with a series of spaced grooves on its inner edge, a horizontal plate resting upon the outer stringer of the forward pair, a vertical plate secured to the inner edge of the horizontal plate, and provided with grooves on its inner face corresponding to the grooves on the rear horizontal plate, braces resting on the forward horizontal plate and connected with the vertical plate between the grooves, partition-plates having openings in their lower edges resting in the grooves of the vertical and rear horizontal plates and upon the inner string-



er of the forward pair, a longitudinal bar secured to the inner face of the inner stringer of the front pair and provided with perforations, screw-threaded bolts provided with hooks for engaging the openings in the partition-plates, and extending to the perforations in the longitudinal bar, nuts engaging the bolts, a swinging frame hinged to the rear horizontal plate, and comprising a horizontal plate, a vertical plate secured to the free edge of the horizontal plate and provided

with grooves to receive the free edges of the partition-plates, braces resting on the horizontal plate and connected to the vertical plate between the grooves, a plate secured to the lower face of the frame extending across the space between the vertical plates, and provided with openings to receive the partition-plates, and handles secured to either end of the frame at the level of the top of the partition-plates.

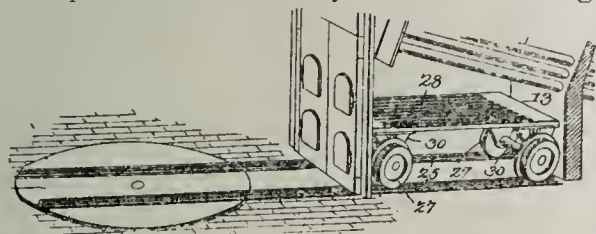
810,044.—Process of Burning Ceramic Ware. Byron E. Eldred, Bronxville, N. Y., assignor to Combustion Utilities Company, New York, N. Y., a corporation of New York. Filed Feb. 21, 1905. Serial No. 246,656.



Claim.—The process of burning ceramic ware which consists in subjecting a penetrable mass of said ware to a voluminous slow-burning flame produced by passing through a bed of solid fuel, an artificially-accelerated draft-current containing free oxygen and diluent neutral products of combustion in predetermined proportions, and increasing the proportion of the diluent as the high temperature zone of the ware extends. The process of burning ceramic ware which consists in producing a voluminous slow-burning flame with a predetermined proportion of products of combustion in the draft-current supplied to the fire, applying said flame under artificially-strengthened draft to a stationary mass of ceramic ware, and maintaining it in operation with the increasing flame volume from the time the ware loses its water and reaches an ignition-sustaining condition until it is completely burned.

810,348.—Furnace. Jacinto Rodriguez y Fonoll, Cienfuegos, Cuba. Original application filed Sept. 26, 1904. Serial No. 226,380. Divided and this application Filed Feb. 6, 1905. Serial No. 244,494.

Claim.—In furnaces, a combustion-chamber, a bridge-wall, a wheeled grate arranged in the combustion-chamber and reversible to place either end adjacent to the bridge-wall.

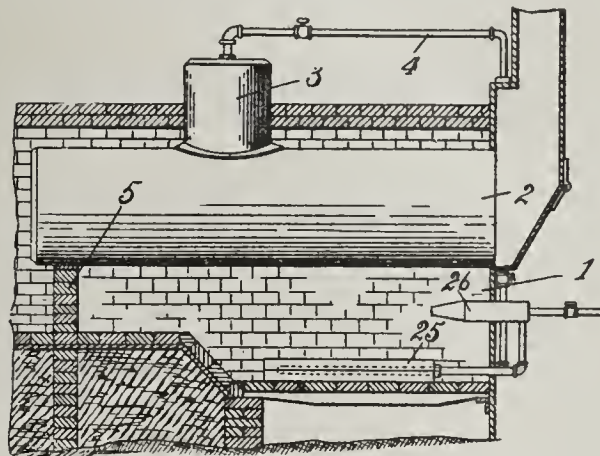


In a heating plant, a furnace including a combustion-chamber, a turn-table arranged on the floor of the fire-room and provided with rails, rails leading from the edge of the turn-table to a point within the combustion-chamber, and a wheeled grate arranged on the rails, the turn-table serving as a means for reversing the position of the grate to present either end adjacent to the rear wall of the combustion-chamber.

810,163.—Apparatus for Producing Perfect Combustion in Furnaces. Harry Luckenbach, San Francisco, Cal., assignor to William H. Kelly, San Francisco, Cal. Filed Dec. 8, 1904. Serial No. 236,060.

Claim.—In an apparatus of the character described, the combination with a furnace, and an oil-burner arranged to

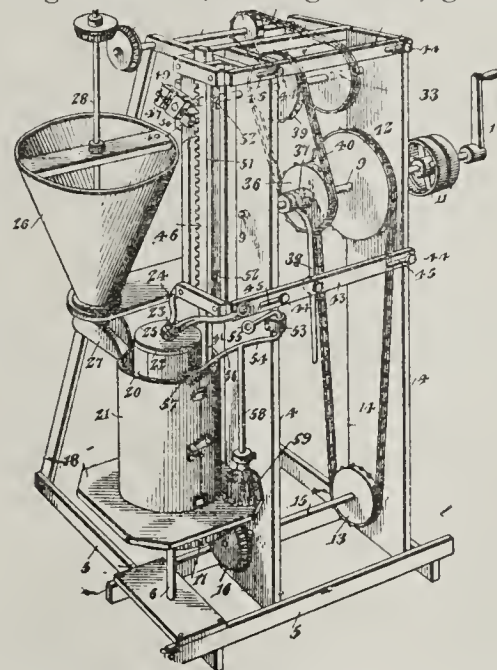
direct the flames into said furnace, of a coil of pipe, a pipe for supplying steam to said coil, and a pipe for supplying steam from said cell to the burner, of a cast-iron casing for said coil formed in two sections, one of said sections having a tortuous channel to receive said coil, corresponding in general form and dimensions with said coil, but sufficiently larger than the coil to permit the latter to expand freely therein, when subjected to a high degree of heat, said casing



being placed in proximity to, but to one side of, and out of direct contact with, the flames from the burner, the whole of the coil of pipe between the entrance of the supply-pipe and the egress of the pipe to the burner being inclosed within said casing, substantially as described.

809,940.—Tile-Molding Machine. Allen Glenn, Scranton, Iowa, assignor of one-half to Silas G. Kious, Scranton, Iowa. Filed Jan. 27, 1905. Serial No. 242,917.

Claim.—In a machine of the class described, the combination with a rotatable mold-support, of a movable tamping device co-acting therewith, driving means, gearing connect-



ing the driving means and support, gearing connecting the driving means and tamping device, said latter gearing including a clutch by means of which the tamping device can be stopped and the support rotated independently of the movement thereof, and means co-acting with a mold placed on the support for finishing an article made in such mold, said means being normally stationary with respect to the support.

The Tampa (Fla.) Brick Co. has been incorporated with \$30,000 capital stock. The officers are W. R. Fuller, president; J. A. Maultsby, vice-president and manager; Frank D. Jackson, secretary and treasurer. They take over the property of the Davis Tile & Brick Co., three miles from town, and will greatly enlarge the plant.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico
and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the sub-
scribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII.

MARCH 15, 1906.

No. 5

"I like to read American advertisements. They are in
themselves literature, and I can gauge the prosperity of the
country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the
very time that advertising should be the heaviest. Ninety-nine
out of every hundred merchants advertise most when there is
least need of it, instead of looking upon advertising as the pan-
acea for their business ills.—John Wanamaker.

The man who exceeds you in politeness is a better man
than you are for the time being.

Many a successful man side-stepped the advertised road
to wealth and sneaked in the back way.

Don't depend too much on the value of advertising meth-
ods. It is the man behind the methods that counts.

What a gilt-edged world this would be if there was as
much enthusiasm at the finish of our enterprise as there is
at the start.

THE CLAY RECORD is the only semi-monthly paper in
America devoted to the Clay Trade. Send in your sub-
scription at once. The cost is only one dollar for a year.

Now and again we are awakened, as if out of a dream,
and made to see some simple thing, which to have insin-
uated we knew nothing about had been taken as a reflec-
tion on our intelligence, that we in fact knew little or noth-
ing about. This thought came forcibly to us in listening to
the paper of Prof. Ira O. Baker on "Pavements."

We knew all about pavements; of course we did, or
thought we did, but it is a fact there is no discussion of
this subject in print, excepting a brief article by the pro-
fessor himself, and yet everybody thinks he knows some-
thing about pavements. Haven't we used them, paid assess-

ments for putting them down, and observed the operations
while the work was being done? But alas! how little we
actually found we knew as the reading of the paper went
on, as the benefits and disadvantages and other details were
made known to us, the effect of which was to make the
paper of great interest and value, besides justifying us in
calling the particular attention of our readers to this paper.
What experience so common, after walking from a depot
to the hotel in a country town on a filthy, uneven sidewalk,
or on a line where one was supposed to be, picking your
steps through mud as to be told "we have a fifty thousand
dollar courthouse," as if the beauty of the town and the
comfort of its people and its visitors could be derived from
and satisfied out of the high-priced town-hall. One-fifth
this sum put into the building and the other four-fifths
into the pavements of the town there had been somewhat
to boast of, and the citizens themselves would be deriving
benefits daily from the comfort and cleanliness of their
pavements.

The broad treatment of the subject by the professor de-
serves the highest compliment, and we are sure our read-
ers will entertain broader views relating thereto which will
result in improvements along this line now not dreamed of.

"The Requirements of a Modern Drain Tile Plant" was
the subject of a highly interesting paper by Mr. J. M.
Powell, Brooklyn, Ind., which paper appears in this issue,
and the reader's attention is called to the same. It de-
serves careful and thoughtful reading. Mr. Powell insists
that the first requirement in making good tile is that the
clay or shale should be good. One's first thought is, "of
course the shale should be good; what else would you use?"
But on second thought and a little investigation the discov-
ery is made that not in every case, not by a large majority,
is the proper material used in the manufacture of tile, and
it is because of this indiscriminate use of material that has
made the manufacture of tile unsatisfactory and unprofit-
able, the sharp competition in price and the quantity of the
inferior material preventing the realization of fair prices
for tile made of good material. This fact has seriously
affected the business as a profitable investment, say nothing
of the effect had on the buyers and users of the material
producing estimations of the business as a whole of an
amusing nature, or would be, if it were not a serious mat-
ter.

Mr. Powell gives a sly dig at the practice of owners of
shale properties, of equal application to other properties,
and a matter to which the people at large are waking up,
the practice, namely, of owners of valuable properties carry-
ing them for years, holding them for fancy prices, yet fight-
ing and (usually succeeding) defeating any fair valuation
as a basis for taxes. If land were taxed as it should be,
and will be in our opinion in the not distant future, then
a few will not control the surface of the earth, nor be able
to avoid taxes on what they do control, being assessed on a
fair valuation based on what the property is really worth.
If a shale property is worth one hundred dollars the acre,

tax it on that basis, and if its owner chooses not to sell, no matter, the owner is contributing his share to the expenses of government, but to allow him to carry the property on a basis of ten dollars the acre is all wrong and discriminates in his favor, which neither the law nor justice contemplate; and as we have said the people are awakening to this and kindred practices and there will result, what this country has for a long time stood in need of, in no property being held by individuals except that for which immediate use is found.

Not in a long while have we read anything describing so clearly the arrangement and operation of a tile plant, and especially interesting and instructive are the details of the management and workings of the continuous kiln system Mr. Powell uses in his plant.

OBITUARY.

Alfred Steel, aged 65, one of the best known operative potters of East Liverpool, Ohio, died at Harmony, Pa., while visiting his son.

Frank Dudenhoeffer, 130 W. 24th St., Erie, Pa., died of pneumonia, after a short illness. For 30 years he has manufactured brick in that city. He was 60 years old.

William J. Murphy, senior member of the Murphy & Lorimer Brick Company, Chicago, Ill., died at his home, 1001 Garfield Boulevard, of pneumonia. He was 38 years of age.

FIRE! FIRE!! FIRE!!!

Wood's Pottery, located on the South Carolina side of the Augusta, Ga., bridge, was totally destroyed by fire.

Fire completely destroyed the storehouse of the A. H. Haws Co., pottery manufacturers at Cambridge, Mass. The loss is \$10,000.

Fire destroyed the entire property of the Malakoff (Tex.) Press Brick Company. The plant will be rebuilt at once on a larger scale.

Fire in the dry kiln of the Everhard Company's plant at Massillon, Ohio, caused a loss of \$1,000. The loss is covered by insurance.

The dry kiln in the brick plant of George F. Weaver & Son, Utica, N. Y., was damaged by fire to the extent of \$1,200. No insurance.

A CORRECTION.

In the last issue of THE CLAY RECORD on page 44 we described the latest Boyd Brick Press Catalogue, and mentioned a few other facts. We stated that the Chisholm, Boyd & White Co. employs 200 traveling men. This was a typographical error, and should have read they employ no traveling men. They make the Boyd press in two, four and six mold presses and not five mold, as was said in this notice.

If you have not received the catalogue it might be well for you to write for it if you are interested in dry pressed brick making. Their office and works are at 57th and Wallace Streets, Chicago, Ill.

ACCIDENTS, DAMAGES AND LOSSES.

By a premature explosion of dynamite at the Mason City (Pa.) Clay Works Nat. G. Thorne, an employe, was seriously injured.

The personal property of the Staten Island Clay Co., at Spa Springs, N. J., has been levied upon for \$4,000, amount of taxes due on personal property to the city of Perth Amboy.

Gertrude Ritzema has filed a \$5,000 suit against the Valley City Brick Co., Grand Rapids, Mich., because of fatal injuries to her husband, who was employed as a laborer in the yard.

The trustee of the Cleveland Brick Co., Canton, O., has been sued for \$10,000 damages by Anna B. Thorley for the death of her father, who was caught in the shafting at the plant and killed.

John Kindt, while at work at the shale banks of the Montello Brick Co., Reading, Pa., in their Fritztown plant, was caught in the hoist apparatus and so badly crushed that he died four hours later.

The Ludovici Roofing Co., Chicago Heights, Ill., has been asked to pay \$75,000 damages to Herman Lohorke, a former employe, who asserts he was permanently injured while in the employ of the company.

Sheriff McGlone of Carter county, Ky., has instituted suit against three fire brick companies for taxes. The Harbison-Walker Company is sued for \$53,966, the Olive Hill Co. for \$12,196, and the Ashland Co. for \$5,640.

The Rockland Co., N. Y., grand jury has presented indictments against the Excelsior Brick Co., John Nicholson and John Reilly, three brick-making firms, for destroying the highway, which resulted in the recent landslide at Haverstraw.

REPORT ON THE GOVERNMENT FUEL INVESTIGATIONS.

The final report covering the investigations during 1904 at the Fuel Testing Plant at St. Louis, Mo., under the United States Geological Survey, has been published by the government and is now ready for distribution. The report will appear in three volumes as Professional Paper No. 48, and will be distributed free of charge. Persons desiring copies of the report should apply for the same to a Member of Congress from their district, or to a Senator from their State.

DRYING BRICK WITHOUT A DRYER.

The above is the name of title of the catalogue of the Scott Kiln-Drying Company, headquarters at 1596 North High Street, Columbus, Ohio.

This is a new method of drying brick, especially one that is such a radical departure from all previous methods, that it requires an elaborate description to be understood. It eliminates to a very great extent hand labor; that of course, means less expense.

If you are interested in drying brick, you had better write at once to the above address and get all information. It is yours for the asking, and do not fail to mention THE CLAY RECORD.

BUILDING OPERATIONS FOR FEBRUARY.

Although the building season of 1906 has not yet opened there is decided activity in building circles, with everything indicating a prosperous year. Official reports from nearly sixty leading cities of the country, compiled by The American Contractor, show that the steady gain over last year that has been chronicled from month to month was fully sustained during February. While the open winter has had something to do with the large operations of the recent past, it cuts but a small figure in the present report, since the permits it records are mostly for buildings that will not be erected before the advent of spring.

Of the fifty-nine cities from which official reports are presented, only sixteen show a loss as compared with February of last year. The loss in Baltimore is 49 per cent, due to the circumstance that the city is now practically rebuilt, or arranged for. The only other cities of importance that show a loss are San Francisco, Cincinnati and Pittsburg, two per cent in the first instance, seventeen per cent in the second, and ten in the last. The gain in New York is 55 per cent, which becomes very remarkable when we remember the unprecedented building activity that has prevailed there during the past two or three years. In other leading cities the percentage of gain is as follows: Buffalo, 94; Chicago, 29; Cleveland, 215; Columbus, 167; Jersey City, 402; Kansas City, 18; Louisville, 574; New Orleans, 196; Omaha, 290; Philadelphia, 124; Toledo, 100; Topeka, 242; Trenton, 290; Washington, 23. From every standpoint the outlook is most promising.

LARGE ADDITION TO KINGSLAND BRICK CO.

Plans are nearly completed for greatly enlarging the plant of the Kingsland (N. J.) Brick Company. A syndicate identified with the scheme has secured an option on 730 acres of land—all meadow land, except twenty acres—adjacent to the leased property of the company, bounded by the Erie Railroad, the Hackensack meadows, the Lackawanna Railroad and Furman hill. A canal will be cut through from Berry's Creek, and the Erie Railroad is to run a spur around the hill to meet the sidings of the Lackawanna company. The canal will permit boats to come from the Hackensack river. The deposit in the newly acquired property is a red-dish shale.

The syndicate, it is said, will expend \$1,000,000 on the project. When completed it will give employment to 1,000 men and furnish an average daily output of 300,000 bricks.

Superintendent Dempsey has incorporated the Dempsey Brick Company that will erect a new brick works at Morris Run, Pa., on a 600-acre plot.

WILL NOT OPERATE THE PRISON BRICK-YARD.

The board of control, all members of which were in Walla Walla, Wash., decided not to operate the brickyard at the penitentiary this year. There is at present over 2,000,000 brick on hand and the sales do not run over 20,000 each month. The boycott made on penitentiary brick by Walla Walla contractors and builders has virtually driven the product of the state institution out of the market.

TO REBUILD BRICK PLANT.

At a meeting of the stockholders of the Hamburg Vitri-fied Brick Company, held at Philadelphia, the following officers were elected for the ensuing year: Directors, John M. Mack, Joseph P. Mack, James M. Mack, A. W. Sewall, George F. Richmond and James M. Carey. The officers are: President, James M. Mack; vice-president, Joseph P. Mack; secretary and treasurer, George F. Richmond.

The company's extensive plant, which was located a short distance north of the Reading depot, at Hamburg, was, with the exception of the kilns, entirely destroyed by fire shortly before Christmas. They have decided to rebuild and are now receiving bids for new machinery, for the erection of the buildings, etc. The new plant will be entirely fire proof, the dryer will be built of reinforced concrete and the main building, which will be two stories in height, of paving brick.

The capacity will be 40,000 paving bricks per day and employment will be given to nearly 100 men. The company has contracts for 4,000,000 bricks for Panama, and for New York and Washington for paving brick.

New Jersey sand has arrived, which will be used in the reinforced concrete. As soon as the weather permits the firm will employ all the available laborers in the vicinity and hurry the completion of the plant. Besides this plant the firm also operates the one at Pine Grove, Schuylkill county.

BULLET ENDS A ROW AT BRICK FACTORY.

Carl A. Westerheide, superintendent of the Patent Brick Company's plant, San Rafael, Cal., was arrested by Deputy Constable George M. Agnew on a charge of assault with intent to commit murder. The charge was sworn to by Harry B. Gilman, the father of Edward Frederick Gilman, a young man who was shot in the right hand today by Westerheide. Westerheide was released on \$2,000 bonds.

According to Gilman Sr., his sons, Harry and Fred, who have been working at the brickyard, had trouble with Westerheide over some plans. The superintendent became involved in a dispute with the boys. Harry Gilman and he had a scuffle, but there were no blows struck.

"Westerheide, after the row," said Mr. Gilman, "secured a revolver and fired four shots at Fred, one of the bullets striking his hand and passing up into the forearm."

Westerheide says: "Both boys were drunk and attacked me with sledge hammers and to protect myself I was compelled to fire two shots. One shot was for the purpose of a warning. I shot in self-defense. The boys were very ugly."

BUILDING ERECTED IN RECORD TIME.

The Delaware (Ohio) Clay Manufacturing Company in rebuilding their plant, destroyed on Christmas eve, have established a remarkable building record for Delaware in mid-winter. The work of rebuilding was begun on January 2d, and completed on the 31st.

The building required the laying of 200,000 brick, 100,000 feet of lumber and 102 squares of roof. The work was done mostly by Delaware masons and carpenters.

DIAMOND BRICK PLANT SOLD TO AMERICAN SEWER PIPE CO.

The Diamond Brick company's plant, at Barberton, Ohio, and all the property owned by the company has been sold to the American Sewer Pipe Company. The deed transferring the property was recorded in the county recorder's office. The price paid for the plant and property was \$57,500. The Diamond Brick Company has long been one of the prominent industries of this city. O. C. Barber is the president of the company. For some time past, however, the American Sewer Pipe Company has desired the plant, and several offers, it is said, were made to the company looking toward the purchase of the plant and all of the property owned by the company located southeast of the city.

Now that the American Sewer Pipe Company has bought the plant, it is understood, it will be used in the manufacture of sewer pipe. At the offices of the American Sewer Pipe Company the attaches refused to discuss the future of the Diamond Brick Company and what the American Sewer Pipe Company would do with the property. The sale was confirmed, however. The Diamond Brick Company's plant was one of the best and most modern plants in the country and brick manufacturers are at a loss to know the exact reason of the purchase of the plant by the American Sewer Pipe Company.

BRICKMAKERS OFFER PREMIUMS TO FARMERS.

The Farmers' Institute has received a proposition from D. F. Morey, secretary of the Ottumwa (Iowa) Brick and Construction Company, in which the said firm agrees to give premiums to the value of several hundred dollars to the farmers of Wapello county. The proposition is the most liberal one ever given to a farmers' institute in any state by a single firm. The farmers are to be congratulated on having in their midst a firm that has their interests so much at heart. The Ottumwa Brick and Construction Company will offer premiums for the best 40-acre field, 20-acre field and 10-acre field of corn grown during the season of 1906. They also offer several valuable premiums to boys under 18 years of age that will grow the best single acre of corn. These premiums in aggregate will amount to several hundred dollars.

COLONIAL TRUST COMPANY SUED AS OUTGROWTH OF STOCK TRANSACTION.

John Wick, Jr., asks \$169,900 damages, and John Wick, Sr., his father, asks \$75,100 from the Colonial Trust Company, of Pittsburg, Pa., the statements being filed. The actions are alleged to be the outgrowth of a stock transaction. The younger Wick says he owned 1,159 shares of stock of the Ford China Company, of Ford City, Pa., and under an agreement he says which was to terminate July 19 last, he turned over all his stock to the defendant so it could have the controlling interest in the china company. It is alleged the defendant refused to return the stock, and by its actions, young Wick alleges, he was thrown out of his position as secretary and manager of the china company. The elder plaintiff also says he turned his stock over, and the return of it was refused.

POTTERY NEWS ITEMS.

The Colesburg (Ia.) Pottery Co. has been making substantial improvements to their plant.

The Pope-Gosser China Co., Coshocton, O., has decided to enlarge their plant in rebuilding after their recent fire.

The United States Electric Porcelain Co., Findlay, Ohio, has been incorporated with \$25,000 capital stock by J. S. Milligan and others.

The decorating and shipping rooms of the Pope-Gosser China Co., Coshocton, Ohio, were destroyed by fire, causing a loss of \$50,000, partly covered by insurance.

The Pfeltzgraff Stoneware Co., York, Pa., which recently burned to the ground, will move from the present site to West York. The work on the new plant has been started.

The Saenger Pottery Works, Elmendorf, Texas, has been incorporated with \$20,000 capital stock. Incorporators: William Saenger, R. Hilker and Alfred Vanderstueken.

The Montrose Pottery Co., Montrose, Ala., has filed articles of incorporation with \$50,000 capital stock. Ashley S. Moses is president and L. C. Dorgan vice-president and general sales manager.

The Water Valley (Ky.) Pottery has been incorporated with \$10,000 capital stock. The officers are O. O. Lassiter, president and manager; J. O. Holland, vice-president; C. S. Chum, secretary and treasurer.

The Patterson Foundry & Machine Co., East Liverpool, Ohio, has closed a contract with the North American Mfg. Co., Newell, W. Va., for a \$25,000 outfit of pottery machinery to be used in their new plant.

The George C. Murphy Pottery Co., East Liverpool, O., will soon start on the erection of a six kiln pottery on the old site which was devastated by fire two years ago. All arrangements have been made for the work.

The Louisville (Ky.) Pottery Works, which will invest \$100,000 in a plant to manufacture flower pots and jugs, has been organized. Albert H. Head of Paducah is the president. The plant will be on the L. & N. in So. Louisville.

George W. Page has bought an interest in the East Trenton (N. J.) Pottery Co., which has been controlled by Wm. Cook for a number of years. A new name, the Excelsior Pottery Co., will be chosen. Wm. H. Cook is president and Geo. W. Page secretary and treasurer.

Plans are being prepared by the North American Mfg. Co. for the erection of a power house at Newell, W. Va., to furnish power and light to the Homer Laughlin Pottery, the largest plant of its kind in the world now being constructed and to be operated by electricity, with the exception of burning the ware.

Brister & Harrison, Petersburg, Va., has been incorporated with \$25,000 capital stock by C. M. Brister, president, and Benj. Harrison, secretary and treasurer. They will manufacture brick, clay and lime.

SAND OR LIME BRICK OR BLOCK NEWS.

Robertson, Ross & Co., Eau Claire, Wis., will open up a cement brick plant in the spring.

Wm. Kelly will superintend the making of brick at the Genesee (Pa.) Sand Lime Brick Co.'s plant.

The Cement Brick & Con. Co., Mineral Wells, Texas, has been incorporated with \$10,000 capital stock.

H. A. Paine, M. E. Palmer and Dan Gavin, Albert Lea, Minn., have established a sand-cement plant at that place.

C. F. Brown, C. M. Denham and Clayton Porter, Punta Gorda, Fla., have formed a company to manufacture sand-lime brick and blocks.

L. S. Anderson, Genesee, Pa., has leased the plant of the Jackson (Mich.) Pressed Brick Co. and will add two new presses and other machinery.

D. L. Stiven, of Grand Rapids, Mich., expects to have his sand-lime brick plant on Pennoyer creek, near Newaygo, Mich., in operation by the 1st of May.

Chas. H. Felton, proprietor of the sand-cement brick plant at Michigan City, Ind., contemplates adding machinery that will largely increase the capacity.

Ashville, Ohio, is to have a cement block and pressed brick manufacturing company. G. A. Hook, E. W. and J. R. Hedges and Samuel Lewis are interested.

The Interstate Cement Brick Co., Camden, N. J., has been incorporated with \$100,000 capital stock. Incorporators: W. C. Corey, F. W. La Phiene and Geo. T. Brinton.

The Knickerbocker Concrete Brick Co., New York City, has been incorporated with \$750,000 capital stock. Directors are: A. J. Browne, David Carpenter and W. S. Hill.

New machinery has been installed in the plant of the Sugar Grove (O.) Brick Company, so that the difficulties which have hampered the plant for some time will be overcome.

The Standard Construction Co., Pittsburg, Pa., has broken ground on Neville Island for a \$600,000 cement brick works. The company will get the sand from the river.

The Newark (N. J.) Concrete Building Brick Co. has been incorporated with \$125,000 capital stock. Incorporators are: H. E. Dodge, Frederick A. Dodge and B. Merklinger.

The sand-lime brick plant owned by Joseph Decarie, Sons & Co., Montreal, located at Cote St. Paul, Quebec, was partly demolished by the drying cylinder exploding. The damage is \$5,000.

The Ash Fire Brick Co., Detroit, Mich., have a demonstrating plant at Toledo and Park avenues, and their first public test was recently made. The brick are from a mixture of coal ashes and a liquid composition and are said to be fire proof.

W. H. Wheeler and others, of Chicago, have purchased a part of the Miller tract of sand in Beloit, Wis., on the south side and will erect a hydraulic equipment that will handle a large amount of sand, also will make sand, lime and cement brick.

MISCELLANEOUS ITEMS.

J. E. Carson of Charlotte, N. C., will start a brick plant at Stout.

Al Morton and a Mr. Taylor are to start a brick plant at Brownwood, Texas.

Charles Smith, of Spokane, Wash., will put in a dry pressed brick plant at Sand Point, Idaho.

James Thomas has bought the Horace Miner brick works at Lewistown, Ill., and will install new machinery.

Nebels Bros. have bought of D. J. Curtis of Springfield, Mass., the brick yard plant on Windsor Ave., Hartford, Ct.

The Morrison-Trammel Brick Co., Rome, Ga., have sold their plant to W. Trammel & Son, who will at once enlarge it.

The Old Horne brick plant on Cocheco street, Dover, N. H., has been sold to Richard R. Morris, formerly of Epping.

The California Petroleum Refineries, San Luis Obispo, Cal., have bought land and will build a refinery and a brick plant.

The American Sewer Pipe Co. has bought the plant of the Diamond Brick Co. at Barberton, Ohio. Consideration, \$57,500.

T. J. Evans and George Beck, Uhrichsville, Ohio, will begin work this spring on a large sewer pipe works that will cost \$60,000.

Alexander Gaston has sold his brick yard at Cliffwood, N. J., to H. A. Bushnell, Fred Lupton, Jr., and E. S. Lupton of Matawan.

The McAlha Brick & Construction Co., Lincolnton, N. C., has been incorporated by W. G. McAllister, C. H. Harrill and S. Alexander.

W. O. Bunnell, M. D., Conyngham, Pa., writes that he has a fine deposit of clay and will put in a plant that will make 50,000 brick daily.

The A. B. Fire Proofing Co., Chicago, Ill., has been incorporated with \$10,000 capital stock by Geo. S. Angus, J. Z. Angus and D. W. Boyd.

Alfred Freeman and others have bought the site of the Old Mud Point Brick Works, below New Cumberland, O., and will build a new clay works.

The Atlantic Efrosite Co., a New York syndicate, is establishing a modern plant for making brick at Lena, Texas, on the A. & A. P. Ry., near La Grange.

J. Abrahamson & Sons, of San Francisco, Cal., has bought the old terra cotta works on Napa creek, north of Vallejo, and will make a high grade fire brick.

The Whittier (Cal.) Brick Co. has been incorporated with \$25,000 capital stock. The directors are John, Edna, Charles and Eugene Cole and Frank Stetson.

F. A. Williams has sold his brick yard and coal business at Jackson, Tenn., to Joe Fogg, Joe Williams and W. H. Moore, and the company will be hereafter known as the Jackson Brick Mfg. & Contracting Co.

The Kansas City (Mo.) Gray Brick Co. has been incorporated with \$200,000 capital stock. Incorporators: R. L. Lawrence, Chas. H. King and D. W. McCrea.

The Buffalo Center (Ia.) Tile Factory has been incorporated with \$10,000 capital stock. E. D. Buckman of Estherville is secretary, treasurer and manager.

The large brick plant of the Hamburg (Pa.) Vit. Brick Co., which was destroyed by fire in December, will be rebuilt at once. The works will be greatly enlarged.

The Malakoff (Texas) Pressed Brick Co. has been incorporated with \$50,000 capital stock, by H. G. Bury, W. A. Daires and E. C. Hoadley of Ft. Worth, and T. Bartlett of Malakoff.

The Battfeld Brick Works at Bucyrus, Ohio, has been sold to Witter & Breisinger. They will dissolve and Mr. John Witter continue in the old plant and Mr. C. Breisinger take the new one.

The Schenectady (N. Y.) Clay Brick Co. has been organized with \$50,000 capital stock and has absorbed the Sherman Case plant at Glenville. Modern machinery will be added to make 100,000 brick daily.

The Drew Brick & Tiling Co., Monticello, Ark., has been incorporated with \$16,000 capital stock. R. W. Finn is president, J. G. Williamson, R. E. Vance, Bordeaux, J. R. Tarrant and W. M. Anderson are directors.

The Seaboard Brick Co., New York, has been incorporated with \$50,000 capital stock by Geo. A. Steves, of 704 Greene Ave., Brooklyn; Henry S. Hooker, 30 W. 44th St., and F. H. Mills, 129 E. 17th St., New York.

The Wyoming Valley Brick Mfg. Co., Wilkes Barre, Pa., has been incorporated with \$500,000 capital stock. Thomas Dunn of Wilkes Barre, Matthias Supp of Scranton and J. H. Bryden of Pittston are the incorporators.

A meeting of citizens of Ennis & Crisp, Texas, was held to discuss the building of a first-class plant for the manufacture of brick at Crisp. A. J. Mullican of Crisp is the chairman and A. H. Dunkerley of Ennis is secretary.

The Saco (Maine) Brick Co. has been incorporated with \$50,000 capital stock to operate the Marston & Durgin yard. Officers are L. B. Stillman of Providence, president; Amos T. Marston, secretary, and James A. Durgin, treasurer.

The Lestershire (N. Y.) Brick Co. has been incorporated with \$100,000 capital stock. The directors are C. F. Johnson, Wm. H. Hill, W. T. Jones and W. H. Windus, all of Binghamton. R. G. Eisenhart will be the manager.

F. D. Reed of Princeton, Ind., and Henry Reed of Petersburg have bought the brick yard of Keller & Hurd at Mt. Carmel, Ill. The firm will be known as Reed & Reed. They will put in new machinery and a Martin system for drying brick.

At the annual meeting of the Oakland Press Brick Co., Zanesville, Ohio, they declared a 4 per cent dividend and voted the rest of the surplus to build new kilns and buy new machinery. The past year has been the most prosperous during the history of the plant.

Edward Beaver, Lewis, Iowa, is putting in machinery for making dry press brick.

The Seneca (Kansas) Shale Brick Co. has been organized and will build a plant on the Peckham farm.

A stock company has been formed for the purpose of building an up-to-date brick plant at Bay Minette, Ala.

J. Shonfield, Arvada, Colo., contemplates putting in a dry pressed brick plant at that place, utilizing a fine deposit of shale.

Garfield, Wash., parties are negotiating for a site for a brick works at Quincy, Wash., where a fine body of clay has been found.

I. J. Harris & Sons, South Newbury, Ohio, have recently purchased a tile plant which they will put in readiness to operate in the spring.

Josiah Reeves of Kirkland, mail West Chester, Pa., has found a deposit of clay on his land and ordered machinery for the operation of a small plant.

The Newton Fire Brick Co., Albany, N. Y., which recently increased its capital to \$350,000, has bought additional land and will double the capacity of the plant.

The Delaware Brick & Terra Cotta Co., South Vineyard, N. J., has been incorporated with \$50,000 capital stock by Samuel Fulton, George Fulton and Cecil Fulton.

Michael Bronk, an heir, has bought the Bronk Brickyard property, and Fred Noble, a former brick maker at Cox-sackie, N. Y., is negotiating for a site at the upper landing.

The Excelsior Brick Co., Fredonia, Kansas, is building new and extensive drying sheds and making other improvements to the plant. J. W. Prate of Chanute has charge of the work.

The Clinton (La.) Brick & Mercantile Co. has been organized with \$40,000 capital stock. Officers are P. A. Fitzhugh, pres.; Wm. M. Empson, vice-pres.; H. H. Forrester, secy. and treas.

A brick and tile plant is to be located at Columbus Grove, Ohio. Stock is being subscribed and local business men are back of the project. The company name will be the Columbus Grove Brick & Tile Co.

NOW READY

A TREATISE ON

PRODUCER-GAS and GAS-PRODUCERS

BY AN ACKNOWLEDGED AUTHORITY.

A 300-page book containing thirty chapters, giving the fundamental principles and definitions, calculations, classifications, manufacture and use; the fuel, the requirements, the history, its by-products, **Producer-Gas for firing kilns, steam boilers, and power plants.** The future of the Gas-producer and a bibliography.

OVER 100 CHOICE ILLUSTRATIONS—PRICE, \$4.00.

A subscription to the CLAY RECORD for one year without additional charge to those that are not now subscribers.

CLAY RECORD PUBLISHING COMPANY

CHICAGO, ILL.

CLAY RECORD.

FOR SALE OR LEASE.

A 32-acre farm, 4 miles west of Macomb, Ill., containing 20 acres of a 10-foot vein of fine pottery clay, with a 5x10 foot shaft in good repair. Also a vein of coal 25 to 30 feet below the clay. Land for sale at \$85 per acre, half cash, balance on long time, one to ten years at 5 per cent, or 6 per cent discount for cash on deferred payment. For full particulars call at premises or address

MILTON W. McDONALD,
Lock Box 39, R. R. 5, Colchester, Ill.

FOR SALE.

One complete brick yard plant, consisting of boiler and engine, stiff mud machine, rolls, automatic cut-off, shifting pulleys, belting. Complete equipment for a 25,000 capacity plant. A bargain if sold at once.

WM. W. THIRLBY,
Traverse City, Mich.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

Profitable running brick plant, 25,000 capacity. Ready sale for entire product. Owner has larger interests requiring attention.

TERRA HAUTE PRESSED BRICK CO.
Terra Haute, Ind.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address
T, care Clay Record,
Chicago, Ill.

FOR SALE.

For sale, reasonable, in condition—
One 6x18 foot Horizontal Tubular Boiler.
One No. 20A Penfield Hollow Brick Machine.
One 14 foot Pug Mill.
One Disintegrator,
One 40 foot Clay Conveyor, with 20 foot belt.
Forty Fire-proofing Dies, with two extensions, pulleys, clutches and belting.
Reasons for sale, are making different ware.
R. 611, W. 51st St.,
New York City.

FOR SALE.

A brick and tile factory, located in Washington Co., Iowa, in a prosperous condition. Would consider an Illinois or Iowa farm.

E. L. TEAL,
Anderson, Ind.

FOR SALE.

A second-hand Four-Mold Dry Press. Has not been used more than a year. Good condition of repair guaranteed. Also good second-hand 44-inch Pulverizer. Address

BOSTON,
Care Clay Record, Chicago, Ill.

POSITION WANTED.

Wanted, position as foreman or manager of a Dry Press Brick Plant of not less than 20,000 brick per day. A number of years experience. Address

ELLIS,
Care Clay Record, Chicago, Ill.

FOR SALE.

Chambers End Cut Brick Machine, capacity 3,500 brick daily. 75 double deck roller bearing stiff mud brick cars.

STRELTON & HARRISBURG BRICK CO.
Steelton, Pa.

FOR SALE.

81-Acre tract of land located in Central Iowa. The finest kind of clay underlaid with coal. Two roads running up to the line of property.

ARTHUR H. LIBBY,
233 Railway Exchange Bldg., Chicago.

Machinery For Sale.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.

Both styles of cars in first-class repair.
ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine.
Address "GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.

THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets.
10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new.
DEALER,
Care Clay Record, Chicago, Ill.

FOR SALE CHEAP.

One second-hand Chandler & Taylor 80 horse-power Horizontal Tubular Boiler, 60 inch diameter by 6 feet long, with full flush front.
AMERICAN CLAY MACHINERY CO.
Bucyrus, Ohio.

FOR SALE.

One 70 horse power Frost Tubular Boiler, one 45 horse power Frost Slide Valve Engine. In good condition, will sell cheap as we have changed to electric power.
CENTERVILLE BRICK & CONSTRUCTION CO.
Centerville, Iowa

WANTED.

An experienced and competent brickmaker to take charge of soft mud plant near Cincinnati. State experience, references and wages expected.
GENERAL SUPPLY & CONSTRUCTION CO.
24 State St., New York.

BRICK PLANT FOR SALE.

Splendid Chance for Contractor.

One of the finest, most modern brick plants for sale in southern part of Central Illinois. Live growing city, good prices, making money. Dry press, built in 1904. Best of reasons for selling. Price \$25,000, if taken at once. Address
ILLINOIS, care Clay Record.

FOR SALE.

A brick and Tile plant, equipped with up-to-date machinery, 60,000 daily capacity, down draft kilns, inexhaustible bed of best clay suitable for all kinds of building, facing and paving brick, drain, tile, sewer pipe, etc., on two railroads, demand very good. Address
B, care of Clay Record.

FOR SALE

A Shale Brick Plant; capacity forty to sixty thousand per day. Six kilns, two 80-horse power boilers and 150-horse power engine. Fifteen acres of land with abundance of shale, makes good paving and building brick. Located on branch of B. and O. Ry. Ready sale for entire output. Address

ROSS W. FUNCK, Trustee,
Wooster, Ohio

PERFORATED METALS

for all purposes
Prompt shipment of all
orders guaranteed.

H. S. SIMPSON,
817 Chamber of Commerce
Chicago, Ill.



Paper Jiggers quoted.
R. A. HART, 41 White St.

No better made, cut from
\$3 and \$10, to
4 Wheel, \$3.00
5 Wheel, \$3.25
Guaranteed.
Sold by all dealers.

BATTLE CREEK, MICH

FOR SALE.

Up-to-date brick plant with Creager machinery, in prosperous city of 15,000 inhabitants, in Southern Illinois. Good residence and farm of 40 acres attached to plant. Splendid opportunity. Only plant in city. Address

H. H., care Clay Record, Chicago.

MACHINERY FOR SALE.

One 4-mold Simpson Dry Press. One Steadman Pulverizer. All size boilers and engines from 30 h.p. up. Send for list.

MERTES MACHINERY CO.
Milwaukee, Wis.

FOR SALE CHEAP.

First-class brick and tile plant. Good machinery, unlimited clay supply, 25,000 capacity daily, 8 kilns 170,000 capacity, dry sheds, etc. Track connections, A snap if taken at once. Address

H. C. MODLIN, Secretary,
Perry, Iowa.

ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

FIRE CLAY LANDS.

500 acres underlaid with heavy vein superior fire clay and light vein coal, which can be mined cheaply, on the line of the N. Y. C. & H. R. R. R., in Pennsylvania, for lease on royalty at low price per ton. For further information address the owner.
BOX No. 308, Williamsport, Pa.

FOR SALE OR EXCHANGE.

One of the best small brick and tile plants in Southern Michigan. 20,000 capacity, Stewart patent kilns, good drying sheds, all machinery in first-class condition, fine clay, good market. Will sell at a bargain or will exchange for good real estate.

Address,
MICHIGAN,
Care Clay Record, Chicago

STEAM SHOVEL FOR SALE.

Barnhart style "B," good condition, large enough to dig clay for 100,000 brick in 8 hours. Apply to
ILLINOIS BRICK COMPANY,
918 Chamber of Commerce,
Chicago.

FOR SALE

One Fate & Co. Brick and Tile Machine. "D" size
One Fate & Co. Automatic Tile Cut-Off Table.
One Fate & Co. Side-Cut Lubricating Die.
One Fate & Co. Brick Cut-Off Table, pallet delivery.

Fire Kiln Bands for 22-foot kiln.
J. C. LANTZ & SON,
Mansfield, Ohio.



Vol. XXVIII. No. 6.

CHICAGO, MARCH 30, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

REPORT OF THE SIXTH ANNUAL MEETING OF THE WISCONSIN CLAYWORKERS' ASSOCIATION.

The convention was called to order by the president, Oscar Wilson, at Menomonie, Wis., March 9th, at 10:30 o'clock.

Meeting opened with a prayer by Rev. C. F. Niles, which was followed by the roll call, thirty-seven responding.

President Wilson: I now have the pleasure of introducing to you our Mayor, the Honorable J. R. Mathews, who will address you.

ADDRESS OF WELCOME BY MAYOR MATTHEWS.

Gentlemen of the Convention: We had a few weeks ago the pleasure of welcoming to our City the Bankers' Association, and, while I should judge from the numbers present this morning that the clay workers are not quite as numerous as the bankers in Wisconsin, I want to say that the clay workers are of vastly more interest to us than the bankers. I noticed one thing at the opening of this convention that the bankers did not have, and that was the invocation. Probably the bankers feel that they can get along without any help but their own.

Now, it is particularly so with us that we feel more interested in the clay workers' association than we do in the bankers', because our city is more dependent upon it and bound up more with it. If there is any association of men, or any class of people, that we are more indebted to than any for our prosperity and really our wealth, it is the Clay Workers' Association—those who are members of it.

Delivered at the 28th annual meeting of the Illinois Clayworkers'

We are proud of our brick industries in this city, and knowing that they are present with us here this morning, I would say to you that we are proud of our local management of our brick industries, but I do not like to flatter them. Now, the brick industries here afford to us largely, practically the only opportunity, or the only opening that we have for common labor. It employs largely all the common labor of our city and gives it employment and good wages a good part of the year. If there is anything that affects the brick industries, we see it immediately in the business interest of the city. If there is anything that affects it injuriously, we immediately feel it, and for this reason you can see that our brick industries are bound up with the interests of our city more closely than with any other association of men. We take more interest in them and more pride in them and we hope and we also feel that when you are prospering we are. You cannot prosper unless we prosper to the same extent, and we hope that the outlook for you during the coming season and for many seasons to come is bright. We hope that there is profit in your business. We hope

it is to such an extent that you will at some time not far distant increase your business and your interests here. We have always tried to be fair with you in the way of dealing with you—in the way of taxation. We are not Socialists. "Live and let live" is our motto. As president Roosevelt said, we believe in a square deal. We ask nothing of you but what we would be willing to do ourselves in turn.

Now gentlemen, we welcome you and welcome you with open hearts. We hope that your stay here will not only be pleasant, but we hope that your meeting will be profitable to you as an Association and in your business. While you stay in our city, if there is anything that you wish to see or anything that we can do to make your stay here more pleasant, we would be very glad to do it. If you wish to visit any of our public institutions, please make it known. The city is yours and we heartily welcome you.

Gentlemen, I again bid a hearty welcome to our city. (Applause.)

President Wilson: Mr. Clifford, our Vice-President, was to respond to the address of welcome by our Mayor, but I have received a telegram from him stating that it would be impossible for him to be present at this time. I, therefore, request that our Ex-President, Mr. Hinkley, of Green Bay, respond to this welcome.

RESPONSE TO ADDRESS OF WELCOME.

Mr. President, Gentlemen of the Convention: Being called upon quite unexpectedly to respond to this address of welcome, I trust that you will excuse me for making it rather short and perhaps in some degree disconnected.

We are all pleased, in response to the welcome of the Mayor, to extend our thanks for that welcome and we hope to take advantage of many of the things he has offered us. I have been a member of this Association and attended its meetings since it was organized. I believe in 1900. This is the sixth annual meeting and I think I have only missed once. I remember at the first meeting that we attended when we first organized in Madison that Governor La-follette gave us an address of welcome, and one of his chief remarks was that perhaps the meeting was for the purpose of raising the price of brick. We assured him that we had no such idea. We can say the same to the Mayor of this city—that we are not here for that purpose. We are here to swap experiences and I think we do that more at the hotel than here. This meeting is devoted to the reading and discussion of papers, but when we get down to the hotel, we hear what every other man has done and the bad experiences that have cost him money. These experiences remind me of events while I was a boy on the farm over here in the central part of Wisconsin. One of our neighbors had quite a large field and in the center of that field was a single tree. He thought he wanted to cut that tree down so one day we went out

with an axe and a pair of colts. He looked around and thought he could tie the lines around his leg in the absence of any other place to tie his team to. He then took his axe and started to cut down the tree. When the tree began falling the colts started to run. Well, some time after, when the neighbors had rescued him—picked him up with his clothes torn and face all scratched up and bloody, one of them asked: "What did you do that for?" He said: "Well, just as quick as those colts started, I saw where I had missed it." So, we are here to swap experiences—tell each other where we have "missed it before the colts started." I see some faces around here that I know can tell some experiences where they had "missed it," which would not have happened if they had attended these meetings before they met with their experiences through which they lost money.

Now, the Mayor tenders us the freedom of the city, and I can assure you that we shall all take advantage of it, but I want to say one thing in conclusion, that if he, as chief executive of the city, finds any of the members of this association in the hands of his policemen, to just send them up here and we will take care of them. (Applause.)

President Wilson: The next number on the program is an address by the President, which seems to be of a more or less stereotyped form for gatherings of this kind, but to carry out that part of it, I have prepared a paper briefly along these lines.

ADDRESS BY THE PRESIDENT.

Gentlemen of the Wisconsin Clayworkers' Association: You have just been welcomed to our city by our worthy Mayor, Honorable J. R. Mathews, and while he has covered the ground thoroughly, it seems but fitting that I should take this opportunity of expressing the sentiment of the Menomonie clay working industries in saying that as fellow-craftsmen, we are also pleased to extend to you a hearty welcome.

The clay workers of Menomonie are striving to maintain the high standard their product has reached before the builders of the Northwest, and of increasing the output and sales of their product until they now have a total output of about 25 million brick per annum.

The clay workers of Wisconsin no doubt appreciate the fact that clay products have not been used as extensively in this section of the country in the past as will be done in the future. The large lumber industry that has prospered for so many years from Wisconsin forests is now practically through with its harvest and it will be only a few years until the cutting of lumber in this state will be a thing of the past. All this has a tendency to increase the price of lumber and also increase the use of brick, and to meet the increased demand and supply a building material far superior and absolutely fireproof is itself encouraging to all clay workers.

The so-called substitutes for building brick—such as sand lime bricks and concrete—are in a more or less experimental stage. All of these materials are unquestionably first-class for special purposes in connection with construction, but for building purposes time will serve as the best evidence.

Your committee in charge of the program would feel that an apology is in order for its brevity, if it were not for the fact that they had tried to get a few more numbers on but were absolutely unable to get any other assignments accepted. The members of this association should not be too selfish and expect a first-class program to be made up for their benefit by a few individuals. Remember the words in the Good Book, which say: "It is more blessed to give than to receive," and apply this to any information you may possess upon the various subjects that confront us at these gatherings. Our annual conventions need the staunch support of every member when called upon to handle any subject on the program—either large or small—and it is essentially necessary, in order to keep abreast with the times and for the welfare of our organization to accept the assignments on the program and handle them the best you can. While our program is brief, we hope that each member present may find something of value in each subject and its discussion.

At our last annual meeting in Manitowoc, a resolution was adopted authorizing the Secretary to drop from the roll all members who were in arrears in their dues for two years or more. acting upon this resolution and Section 3 of Article 3, several names have been dropped; and on account of our admission fees and annual dues being so small, it does not in my opinion give us as large revenue as we should have to carry on the work before us. Under the circumstances I would recommend that Section 1 and 2 of Article 3, of our Constitution and By-Laws be revised and the annual dues be substantially increased to provide larger revenues.

Inasmuch as the printed proceedings of our annual meetings have heretofore been distributed among the clay workers of the States, regardless of their membership in the Association, I would further recommend that a resolution be passed at this session providing for the printed proceedings to be sent only to members of the Association in good standing.

In closing I want to thank our worthy Secretary for his untiring efforts to make this meeting a success and also to thank the members who are contributing to the program, which we will now take up. (Applause.)

Mr. Hinkley: Would it not be proper at this time, since certain recommendations were made by the President, that a Committee be appointed along these lines to go over the matter thoroughly and report on the changes recommended tomorrow? I make a motion to that effect.

The motion was placed before the Convention on a vote and carried, and the President appointed Messrs. Hinkley, Ringle and Bright to form this Committee.

President Wilson: The Secretary has some communications, which he will read.

Secretary Hamilton: I will first read a communication which was received from Mr. E. R. Buckley.

Rolla, Mo., March 7, 1906.

To the Wisconsin Clay Workers' Association,

Monomonie, Wis.

My Dear Friends:—

The time for another meeting of our Association has arrived and your humble servant must be numbered for the third time among the absent. I have read with pleasure the enthusiastic reports of those who have attended the conventions in our sister states, and I anticipate much great pleasure when I read the proceedings of the Wisconsin association meeting.

I have often thought that the members of an association of this character, coming together for mutual help, are often too sensitive over their mistakes or failures in business and too secretive about their successes. It has been demonstrated, over and over again, that any help that we may render our brothers will not injure us or our business. We all desire to attain success in our several vocations, but we should never let this ambition encompass us to such a degree, that we are willing to walk over and ruin another in order to accomplish this end.

I, therefore, suggest that you bring your troubles before the association and that you give aid to him who may seek it.

As the clayworking industry develops in all parts of the state, each will receive his share of the benefits. Manufacture the best brick you can with the materials at hand and as cheaply as possible. Never lead yourselves to believe that you are making the best possible product, for the man who is satisfied adds very little to the progress of civilization.

I have observed everywhere, in every industry, that there is unnecessary waste, frequently enough to make an unprofitable business profitable. Does your machinery run smoothly? Do you use more men than others in handling your brick? Does your fuel cost you more than it does your neighbor? Your fuel costs you 5c per M; your labor 20c per M, and delays on account of imperfect machinery 10c per M more than your neighbor. This is only 35c per M. But, should you produce 5,000,000 brick, it would be a loss of \$1,750.00.

There is greater profit to the manufacturer in the reduction of the cost of production than in an increase in the price of the fin-

ished product. When competition and low prices make business dull, it is the man who knows how to economize in the cost of the production who feels the depression least.

This association has resulted in great good, not only to the brick manufacturer, but to the people of the state as a whole. It is not only a pleasure, but an honor to be one of its members. Do not permit your interest in it to weaken. Give to it all you can. Receive from it all that it offers.

May success, prosperity and happiness ever attend you and may each succeeding meeting be better than the last. Believe me to be,

Your Friend,

E. R. BUCKLEY.

Secretary Hamilton: Mr. Buckley encloses a check for \$2.00 for dues. I do not think that we ought to accept this. The Committee on membership voted him an honorary member and we did not allow him to pay anything at that time. I think we ought to have some expression from the members on this matter.

Mr. Kennedy: I make a motion that the check be returned with thanks and also that some expression be made to him thanking him for his letter.

Mr. Hinkley: I would like to say that this Association owes its origin and its success to the efforts of Dr. Buckley. He traveled all over the state, inspected every brick yard, I think, in the state, and every clay bank that looked as though it held clay, and after doing all this and becoming acquainted with all the brick makers, he sent out invitations to them to come to Madison and was the prime mover in the organization of this Association, and I heartily concur in the motion made by Mr. Kennedy that we tender him our thanks for his good wishes and for his letter and to return his check, but to tell him that he is an honorary member as long as he continues to send us a letter every year. Motion was seconded, and unanimously carried, and the Secretary instructed to act in accordance with it.

Secretary Hamilton: I have here another letter from Mr. P. G. Duerrwaechter, which I will read:

South Germantown, Wis., January 23, 1906.

Mr. J. C. Hamilton,
Grand Rapids, Wis.

My Dear Sir:—

It is my unpleasant duty to inform you that my son, Arthur, who was the Secretary of the Wisconsin Brick & Tile Co., located at Granville, Wis., passed away October 29, and was buried November 1, 1905. I, therefore, forwarded your invitation to John Flanagan, Lannon, Wis., who is the president of the above named company, with an urgent appeal that he will take the place of my son and attend the meeting, in which you may assist me by writing another letter to him. This together with mine may induce him to attend.

Enclosed find check for \$1.00 for back dues, which I hope you will place to his credit, and if there are any further charges or accounts against him, I hope you will report it to me, and I will gladly remit.

The continuance of membership I will have to leave to the disposition and wishes of the officers of the company and the successor of my son.

Yours truly,

PH. G. DUERRWAECHTER.

Mr. de Joannis: I move that the Secretary be instructed to write a letter of condolence to Mr. Duerrwaechter. I was very well acquainted with his son and know him to be a very nice fellow.

Secretary Hamilton: I will write Mr. Duerrwaechter a letter, but I thought it would be well to appoint a committee to draft a set of resolutions to be forward to him; and I make a motion to that effect. Motion was seconded, and carried. The President appointed Harry de Joannis, S. Weidman and Wm. Gunther to frame resolution.

President Wilson: Have any of the members anything to present to the meeting at this time?

Mr. Kennedy: Mr. President, would it not be a good idea to appoint some committee or that some steps be taken at this time

regarding freight rates that we have been considering so long. I have been a member of this Association for four years or more and our talks on this freight rate problem have been very much the same every year—very much like a crowd sitting around the country store—all air. I think we need a change. I think we ought to say what we are going to do. At first we waited for the Rate Commission to be appointed. We did wait and we know what they did. They cannot be expected to come and sweep our back door. We have to go to them and lay our case before them. I have traveled through all the northern part of Wisconsin and have visited the dealers there. I know from the prices they are receiving that we are not getting what every man is entitled to as Mr. Roosevelt said: "A square deal." I think the time is ripe; we are here. I think that this Association is composed of men that are willing to meet that phase of the question and meet it now. We do not want any that are afraid to show their faces and afraid to go to some trouble. If our President will appoint a Committee and that Committee feels that they are in position to come out and let their position be known, and I think that we can find timber in this crowd that can come out, and bring this matter before the Railroad Rate Commission, and that will bring it where it will be disposed of. This making resolutions every year and taking the matter over at our annual meetings and then postpone the matter will not go. We will have the same question next year. I think now is the time to take it up and I believe if the Chairman will appoint a Committee, this Committee should take some immediate action and let its position be known before the Railroad Rate Commission. We do not have to fear the Railroad Companies. You will never accomplish anything by standing on your own ground. You will have to take a stand before this Commission. You must take the initiative. They have no respect for the man that comes out and cringes to them. We want a square deal in this matter. Why are we not getting it? Because we do not let our wants be known. (Applause.)

President Wilson: I believe there was a committee appointed last year to take this matter up and that Mr. Kennedy was one of them. I should like to ask Mr. Kennedy who the other members of the Committee were supposed to be.

Mr. Kennedy: Mr. Clifford Chase was one of them and Mr. Dickinson the other.

Mr. Hinkley: I move that the Chair appoint a Committee in conformity with Mr. Kennedy's recommendation. I believe that the Committee that acted last year was appointed for the ensuing year only and that its labor ends at this Convention. I, therefore, move that a new committee be appointed at this time.

President Wilson: I wish to say, gentlemen, that several papers on this subject have been called to my attention and I have had one of our local attorneys look it up to enable us to decide what was the best action to take from a legal standpoint, if from no other, and he has not made as detailed a report as I had expected, but I will have it later in the day, or at the latest tomorrow morning in such shape that it will be a brief opinion as to what rights we might have from a legal standpoint.

The motion was seconded, and unanimously carried.

President Wilson: Is there anything further to come before the Convention at this time? I will announce this Committee later.

Mr. Ringle: I move that the Chairman be authorized to appoint a Committee tomorrow to select a place for the next annual meeting and also a Committee to appoint the names of officers for the ensuing year. The motion was seconded, and unanimously carried.

President Wilson: I will say that I will not appoint the Committee until later—possibly I will be obliged to wait until morning on account of some doings that we are going to have this evening that might conflict with the working of the Committee somewhat—possibly they might go to lobbying too much.

I wish to say, gentlemen, before adjourning for the noon recess, that the Superintendent of our schools has asked me to extend an invitation to spend a few moments in the schools immediately after noon—that is to say our program commences again at 2 o'clock,

but we can spend an hour without inconvenience from 1:30 to 2:30 in the schools and be able to get through with our afternoon's program. I should like, therefore, very much if the members would accompany me in going through the manual training school and see the boys at work there. Meeting adjourned till afternoon.

AFTERNOON SESSION.

The meeting was called to order by the President, and he announced the first number of the program, "Brick vs. Concrete," by Mr. John Ringle of Wausau.

BRICK VS. CONCRETE.

I assume that the subject assigned to me has reference to the clay brick, which has an extensive record with the history of mankind. It has been in competition with and demonstrated its superiority over all classes of material for permanent construction, whether natural or artificial.

It is, therefore, perhaps, useless to waste words extolling its merits, when there are none to deny them. From every point of view, resisting the elements of decay, fire or water, uninfluenced by the "knowing tooth of time," overcoming the effects of heat or cold, or in supplying every artistic design in its natural and permanent color, the clay brick stands without a rival and supplies every demand.

I understand that at least one of the purposes of the Clay Workers' Convention to be, the promulgation of experimental and scientific facts, for the further improvement and maintenance of the quality of our product, and to perpetuate its superiority. If, therefore, we take occasion in our proceedings to refer to a competitive material—cement concrete—it is not for the purpose of depreciating its well known merits, for in its proper place it is a valuable auxiliary to the clay product.

Since the consumption of the perishable material for building purposes, timber and lumber has reached the period of its limitation, there will no doubt be ample demand for all good materials produced by nature or science to supply the wants of man. We can, therefore, hardly be accused of selfishness in performing a duty we owe to our patrons and the general public, in calling attention to the defects of the so-called cement block as a building material.

The past several years has been an era for the introduction of building materials in competition with clay products. The seller of the cement block machine in fifty or more varieties has exploited the country. People have been led to believe that with a \$300.00 machine, a sand bank and a little cheap cement, any ordinary person in a back yard could produce a cement block, equal, if not superior, to any building material on the market and at less cost. Visions of riches thus loomed up on the horizon, and as a result there is scarcely a hamlet which is not blessed with one or more cement block machines. Profits thus far have only been realized by the machine man and the manufacturer of cement.

Numerous impediments have made their appearance, checking the considerable use of the cheap cement block as a building material. It was found that cheap blocks could only be produced at a sacrifice of their quality, and that even if well made and strong enough, they are not a good building material. Moisture penetrates the cement block—even the hollow block—and the inside of the building is damp. Various preparations for saturating the block to overcome this defect are advertised. None are entirely successful. A man who builds a house wants to come in out of the wet, and not have the wall plate commence to decay as soon as laid. Aside from this are the disastrous effects of expansion and contraction causing cracks in the walls, and the tendency to efflorescence (salt-petering) that usually makes its appearance after every considerable rain. This latter might be tolerated for it adds variety to the otherwise sombre appearance of the structure. These are the defects of the good cement blocks. What shall we say of its unreliability? The tendency of the maker for commercial purposes, is to make a cheap block, by a haphazard process, and the use of an insufficient proportion of cement of unknown quality, and,

therefore, weak and uncertain. The defect of weakness in a cement block cannot be readily detected, while a poor brick, not properly made or burned, can be detected at a glance. My information from men of experience is, that the difference between a good and inferior block is liable not to be discovered for several years. The purchaser must, therefore, rely wholly upon the integrity of the maker. I will leave the cement block by quoting the words of Lauer of Chicago, a man of much experience in the block business. He says: "Soft, absorbent blocks are no more fit to enter into residence construction, exposed to alternate rain and frost, than the myriad of water-guzzling, hollow concrete blocks now flooding the market. There is a legitimate field for genuine concrete, but neither the soft, hollow, clay wire, nor concrete in hollow form as now produced on one thousand and one different hand machines by as many different men and as many different mixtures, are fit materials to use for exposed walls in residence construction."

As to cement concrete construction in other forms, it is also believed that this is being carried beyond its proper limits. Concrete structures involving the steel re-inforced method are subject to the expansion and contraction of large cement bodies. In addition the porosity of the material is such that under many conditions, it may cause the steel to corrode and the structure to crumble within the life of men. From present experience, such construction is at least of doubtful value. The matter is comprehensively stated in an editorial in "Carpentry & Building," which says: "Many engineers and architects are of the opinion that the use of concrete is being carried too far." The manufacture of cement products for building purposes should require at least as much scientific and technical knowledge and ability as the manufacture of the clay product, leaving out the question of human selfishness and as yet I have failed to find a past master in the art of brick making. In a well-burned brick, however, all perishable organic and combustible matter that may be in the clay has been destroyed and removed in burning and a stable combination formed. The result is durability, strength and beauty, and the elimination of all hazard and doubt.

We sometimes meet the claim that concrete has superior fire-proof qualities. While men of experience need no proof of the fact that burnt clay is the only fire-resisting material available for building purposes, yet it may be proper to quote from the report of the Insurance General Loss Committee on the Baltimore fire, perhaps the severest test on record. "Well burned brick and plain terra cotta are the only materials that stood the heat with any degree of success. Granite marble and ornamental terra cotta and all kinds of building stone prove a failure when exposed to a fierce heat."

"A material extra premium should be charged on all buildings built or faced with granite, marble or any building stone. The percentage of loss on these materials has been exceptionally heavy, and will be so from an exposing fire even in cases where the loss on a brick building would be nominal."

The report concludes as follows: "There is many a lesson to be learned as a result of the Baltimore fire, and the wide awake manufacturer of building material will seek to make none but the best, and he will see that it is properly put in place, as the capitalist who puts money into fireproof material will come from 'Missouri' and have to be shown, as in the future much will depend upon the kind of material and manner of construction in fixing of rates for insurance. The material that has stood the test best can be spelled with five letters and that is BRICK; next comes terra cotta, and is followed by porous and semi-porous tile."

After all this has been said, it may not be out of place for me to add in conclusion, that it is not sufficient for us to know these facts. We are aware of the great advancement made in the manufacture of clay products during the past decade, and know that our product is the best. Does the public know? Our competitors are intelligent men and do not fail to advertise their material. Building will in the future as in the past constitute one of the important functions of man. We should not only endeavor to

maintain the lofty position which our product has attained, but our aim should be ever forward both in the quality of our materials and as to its place in the building world. (Applause.)

With your permission I will read a little poetry, which I think is very befitting on this occasion:

From morn of man, when clay inhaled the breath of life,
From Babel's dizzy tower, where elevation caused strife,
From Pyramids' ancient pile, celestial guard for tartar foe,
What through time to date, is favorite on builders' row
And ever will remain, while rivals grow sick?
Say, shall we write it CONCRETE or write it BRICK?

From Chicago's greatest fire, Baltimore's seething hell,
What sentinel gave answer, "All is well!"
Of whatever make, common vitrified or pressed,
When each has a mission and for it is best,
Let makers' tools give answer, barrow shovel and pick.
Will they make it CONCRETE or call it BRICK?

What fills labor's wants and that of finance high,
Rears monuments of art into the sky?
Not monopolies, easy mark, not that of graft,
The balm of Summer day, a bar to north wind's draught,
Let it ever lead the way, till time shall cease to tick.
And not write it CONCRETE but write it BRICK.

Then may the guessing stew (witches' stew) to cooler shades retire,
And not block the path of that, fit to go up higher,
Though in recent pretense, but a stranger in the camp,
It has served a good domestic in places which are damp.
When railroad rates, unjust rebates, give us cause to kick,
Then let it be the CONCRETE and not against the BRICK.

President Wilson: There is no doubt a great deal in this paper for discussion. I would be glad to hear from anyone who has anything to offer on the subject. Mr. Bright have you any questions to ask Mr. Ringle on this subject?

Mr. Bright: No, not particularly, but we have a man here who represents a paper which supports the cement block.

President Wilson: Mr. Covey have you anything to say on the subject?

Mr. Covey: I do not know anything more about the manufacture of hollow blocks than I do about the manufacture of brick. Hollow block, as you know, and their manufacture, are in their infancy. People who have been making brick for years and years think they have a great deal to overcome. Of course, the brick makers have to put up with all sorts of original material—that is one of the things that you are figuring against and that is what you are, discussing. Now then, the hollow block men have all that to learn yet. I am not an exponent of the hollow block. I am not advocating one or the other; but, as I pass around from one brick yard to another and as I come into contact with the hollow block man I see a few of the things that pertain to his particular line. You will notice that in our journal we do not advocate the distribution of any product. You will notice, that is rather peculiar—in fact, I have been almost at my wit's end to get anyone to advertise the sand-lime brick. They are still at an experimental stage. In time they will get it a great deal better than now. The trouble seems to be in getting the right combination of moisture, cement and sand. You cannot get the right amount of moisture with the sand and cement. It makes no difference what kind of cement you use, you cannot always get the right combination—that is the trouble. Now, with poor brick that enters into its manufacture and the responsibility falls back on the manufacturer. The hollow block man may for a while be able to shift his imperfections on the consumer simply because his manufacture does not develop the quality. I think, therefore, listening to the foregoing paper, I think that if a hollow brick will last for a year or more it will stand for a long time. It is new yet. The cement block must absorb enough moisture to satisfy the requirements of the cement. I am telling you this without knowing

much about it but I am just telling you what I see. Some of the hollow block men are now making what they call a "slot block", using more moisture to satisfy the requirements of the cement, if possible. I think that some of these men are going to come to the right point. I think the dry block is a bad proposition. It has to absorb the moisture some time. So, about all that I can tell you is that in my opinion the hollow block is a comparatively new thing and one of the future. We do not know how soon, but they are working at it and are trying to perfect it. You who have been a good while making brick must give the hollow block men a chance to correct their errors. They may make a success later on.

President Wilson: In speaking, Mr. Covey, of moisture, do I understand that the moisture all go into the hollow block at the time of manufacturing it, or after?

Mr. Covey: Now, you are going to catch me on my lack of knowledge; but I know that they put these hollow blocks up in piles and put water on them. They attempt to supply the lack of moisture. You have all been to these Conventions: you have seen these hollow block machines demonstrated. These machines are all good as far as the hollow block machines are concerned. The trouble is the proper combination of ingredients is incorrect. At a convention that I attended some time ago there was a man there that had a granite product. This man was from New York and he has arrived as near to the proper proportion as it is possible. The hollow block men have to find this out. You know there is a lot of stone used in buildings that is worthless—a lot of lime stone, etc., that scales and peels off from year to year. There is much worthless stone used in buildings. The hollow block will be better than that if they can get at the right combination. This man from New York made his product of stone in a mould and gave the mixture time to absorb the water and take into itself the proper amount of moisture. His mixture was more nearly correct, I think, of any product of that character.

Mr. Crabtree: I would like to ask if any of the clay workers in Wisconsin are doing anything in the line of hollow clay building blocks—such as the vitrified blocks 8x16 in size made in Indiana and Ohio. I have inquired of several and I cannot get any information. I am entirely ignorant on the subject myself. I would like to know how they do it here if there is anyone here that is doing it. So far I have been unable to get any information on the subject.

President Wilson: Our friends in Tramway, about five miles from here, have made more or less hollow clay brick but they do not seem to have any representative here at this Convention. Probably they are not running now and I do not know how much stock they have on hand but I understand that they have some.

Mr. Farnum: At Grantsburg we are successful in making them. We make them 4x8x12 and 18. We have made none of them extensively but have only fairly started. You can make them vitrified and hard enough for ordinary use. They will take the place of concrete. You can lay up a course of common or veneer brick on the outside and use these on the inside.

Mr. Stoll: If you are inquiring about vitrified blocks made in Wisconsin: I think at the present time there are none, although there are some clays in Wisconsin that will make them. There is no one yet making vitrified blocks in Wisconsin like they do in Indiana and Ohio. There is a difference between the clay block laying up in the wall and the cement block. When you make a clay block 8x8 square and 16 inches long, you have a surface for your mortar to go on 8x8x16 and in the cement blocks you have only a surface for the mortar to go on 1½ to 2 inches. They have no trouble with the clay blocks, as I have seen them, as they have with the cement blocks in this respect.

Mr. Weidman: What is the relative size of the concrete space and the amount of the absorption.

Mr. de Joannis: That would depend upon the burning of the clay block. I took the best cement blocks the other day and it took about two quarts of water. Vitrified clay blocks will take about one pint of water.

Mr. Stoll: Mr. de Joannis, what make of that clay block did you get?

Mr. de Joannis: It was an Indiana block.

Mr. Stoll: Did you ever try one of the Mason City blocks?

Mr. de Joannis: No. It depends upon whether it is made from a shale or other material. And it depends upon the burning. I think the more the clay workers know what the cement people have to put up with in manufacturing their hollow blocks, the less they will be afraid of competition in this direction. There are two things the cement people cannot overcome. In the first place, the manufacture of any cement product depends largely upon personal factor—that is to say—I saw a report the other day of a large meeting where the person who read the paper insisted that a great advantage that the hollow concrete men had over the rest was that he could use ignorant labor. Therefore, you get the most ignorant kind of product from such labor. Personal factors do not enter into the manufacture of concrete blocks. A man if he does not get quite the correct mixture of concrete, sand, etc., will simply put so much more water to it, or so much more sand to it, as the occasion may require, and you can take any kind of block or brick that you want and you will find that they vary very little. In the manufacture of the cement itself great care is taken. Take for instance the Alpha Portland Cement. I went through their plant. Their output is 12,000 barrels of cement per day. This cement goes through a very great many different processes before it is turned out a finished product. After each stage of its manufacture, it is carefully inspected and tested to insure its absolute purity.

Mr. Farnum: I would like to inquire of some one if the block or brick, or anything that is thoroughly vitrified, if it is not nearly as impervious to the elements as a block of iron or a solid mass of iron?

Mr. Stoll: I should say it was practically as impervious as iron or steel. It is of very nearly the same density. There is this difference—iron will rust and vitrified material will not.

President Wilson: If there are no other questions to be asked on this subject we will proceed with the program. The next number on the program is the subject of "The use of waste heat from common up-draft kilns for drying brick, vs. open air drying," by Mr. G. W. Kennedy of Manitowoc.

THE USE OF WASTE HEAT FROM COMMON UP-DRAFT KILNS VS. OPEN AIR DRYING.

Mr. Kennedy: I had had prepared a paper on the subject but find that I have left it at home. I remember it pretty well, though, and will, therefore, speak extemporaneously. I should very much have preferred to have been called on before Mr. Ringle. I assure you that I think Mr. Ringle has set the pace altogether too high for me to follow. When this subject was assigned to me, I thought I had an easy task. It is a question that has cost me many anxious moments in my business and I have made a thorough study of it and through trouble and experience, I thought it would be an easy task to tell the convention all about it. But, people do not care to hear your troubles, and when I came down to write the paper, I found it was a very hard matter for me to do. It is like the story you have all heard: "Laugh and the world laughs with you; weep and you weep alone."

Before saying anything about our waste heat, I want to first give you a description of the driers as they are today. Our experience with driers do not differ very much from the experiences of other people. I do not know of any other way of putting it except the way our foreman, Mr. Frickie, at Manitowoc did when I commenced to get up this paper, I went to him and asked for a few pointers about the drier as it worked. He said, "Well, you are just like all other young men. Not one of you will tell the truth. You commence on a scheme and tell the other fellow how it works and the other fellow will say the same scheme does not work with him." Our experience in driers, I think, is the same as that of every other man that has had anything to do with driers and that is that when we begin we do not know what we are up against. We think we do but the facts are we do not. Some man comes along and tells you that he can put in a drier that will accomplish certain things. At first you are not certain that he can, but he insists upon

it and you then believe that he can. If the Clay Workers of Wisconsin would attend these Conventions and exchange ideas they could save a great deal of money for themselves. Our driers at Manitowoc are a combination of driers. They are about 140 or 150 feet in length, twenty tracks, each track holding 20 cars. This gives the drier, when full, a capacity of 400 cars of brick. Each car holds 544 brick. Now, our brick after they leave the moulding machine contain about one pound of water which has to be absorbed in the drier. The brick when they leave the machine are loaded on these cars on pallets and these cars are then pushed into the drier. There is a gravity system which carries the cars from the machine down through the drier. We have a fan at one end of the drier that blows the air up under the cars. This air escapes under the cars through the openings in the planks. Then we have a fan at the other end of the drier drawing out this moist heat. This keeps a constant circulation of air through the drier. It makes no difference whether the drier is hot. There must be a circulation of air. After we got the kilns to working in fairly good order, we thought that waste heat ought to be used. So I commenced to figure and finally put a pipe four feet in diameter running the whole length of our kilns. There is about 20 feet of space between each of our four kilns and this pipe run the whole length of the kilns, and at right angles to this four foot pipe, there is a two foot iron pipe extending the length of each kiln and about six feet from the top of the kiln. These two foot pipes are connected to the four foot pipe and a damper is arranged in the pipes as you can shut off any one or all of them, or you can draw from any or all of them. There are a great many systems of taking the hot air or heat from cooling kilns. What we claim for the system that we are using—there is no patent on it—it is open to every one. If there is any good in it I am perfectly willing they should have it. The ducks or air chambers are at the bottom of the kiln and the air cannot be taken from a cooling kiln until you have stopped firing. These pipes are connected with our fan which draws this air and blows it into our drier, coming into direct contact with the wet brick. The saving in that is considerable. It is more than you men would believe if I told you. The night is our worst time. The air is cooler and damper. If you want to get your brick dry you must have circulation and the air must be dry and warm. Pure hot and dry air is what is required. This coming in contact with our brick does not check them for the reason that the brick have already been exposed to the air. If warm dry air is not used before turning on the waste heat the brick commence to crack. Especially is this so in the Spring time or the wet season of the year and on wet nights, or after we have three or four rainy days, which we often have on the lake shore. There we have a great deal of heavy weather.

Now, as to the open air drying—it costs us more to take the brick and put them in the drying shed in the yard—about 15 cents per thousand—more than it does to put them in the drier. There is the cost of labor from the machine to the racks. This is offset by the cost of keeping the drier hot. We figure that we have to have a fireman there anyway. He must keep up his steam. If we have no kiln from which we can draw the heat, it costs us 19 cents per thousand for the coal.

As Mr. Ringle and Mr. Hinkley stated, if people would be more honest and tell their experiences—even if they are laughed at afterwards—it would be much better. They say that "Open confession is good for the soul." That is the best we can do. My estimates, of course, do not include the men's salaries—they do not include the oil for the machinery—nor the wear and tear. It costs more to take the bricks from the machine to the racks than it does through the drier for the reason that it is a little farther way. By the drier system the brick are not handled at all until they reach the hands of the pitchers.

Now, I am not sure that I can say anything more on this drying business. There is one thing that is certain and that is this. This question is very important to every brick man. You can turn out as many brick as you please from the machine but the trouble is to dry them. When you visit a man's plant and ask him, "What is your output?" and he will tell you the capacity of his machine.

When you ask him how many he can dry and he will tell you how many he has room for on the yard. But you ask him how many he can dry and he will tell you that that depends upon the weather. The advantages of a drier is that we can dry brick even if the weather is wet and rainy. I will be glad to answer any questions that any of the gentlemen will ask, but I do not think it is wise for me to take up any more of your time. (Applause.)

Mr. A. Potts: In drying brick on the racks, is there not some danger of their being rain marked, etc.?

Mr. Kennedy: I stated a while ago that brick men will dodge the question. Now, I had a paper written out on this subject but I forgot it and I would not attempt this point without my paper. However, with our drier we do not have trouble with rain marked brick. The brick are thoroughly dried and are not exposed to the elements. There are so many brick put into the drier and there have to be so many brick taken out of the drier every day in order to make room for the brick that are constantly being made. We work every day. Some days we may stop for a few hours on account of too much water in the clay, but the next day we work a little over time, so that at the end of the week we are up to our average. Because of our drier, our brick are of a better shape and we save a great deal of the flashes that a great many brick makers complain of. These flashed brick are caused by handling them in the racks. The brick that are put in the racks for drying you will find the ones that are on the outside of the rack are drier than the ones on the inside, but the men taking them from the racks do not stop for that. The consequence is that when you take them out of the kiln after they are burned, they are flashed. I do not think a yard is up to date without a drier. If there is a soft spot in the brick yard, I cannot find it—not even in the office. When there is any trouble with the drier, the men will come to you with the trouble. You go in there with him. It is very hot at times in there and the man that is with you will get great satisfaction out of the fact that the "old man" is in there and he will not complain any further. You see, the men complain of their hard lot and of the heat in the drier. It is hard work.

Without a drier you cannot start as early in the Spring, neither can you work as late in the Fall. In the meantime, your expenses are continually going on and your office force must be kept up and when you are not making brick you are increasing the cost of manufacture.

The vital point in our drier, as well as all driers I think, is to get the air under the cars and get it distributed. If you are not very careful with the drier you are apt to get the openings in one section of the drier larger than the other and admit the air into one section faster than the other. There is only one way that I have been able to do and that is by taking an anemometer and by it knowing the amount of air going into each section and seeing that it is being equally distributed.

Member: Does it take a little longer drying the brick when you take the heat from the kiln than from the outside?

Mr. Kennedy: Sure, because the brick take the air that is thoroughly dry.

Member: You take the cool air from the outside and you have warm air but not dry air. How much difference is there in the time?

Mr. Kennedy: There is a difference of about eight hours and it takes about sixty-four hours to dry the brick. There is another thing that I find to be true, and I think that every brick man that is running a drier will know this, and that is what is heat? and what style of a drier is best for him? One drier that will work on one yard will not also work on another. There is the difference in the kind of clay used. Some clays dry easier and some are more tender and crack more easily and I think that every man will have to experiment on his own account as to this. I know at our yard we put on our heat and in the morning when we come to set our brick we found a great many of them cracked. There is only one way to accomplish anything in brick dry—and that is to stick to it. You must study the nature of your clay and regulate your hot and

cold drafts of air accordingly. You can get at the bottom of it, or at the right way only by experience.

There is one thing about this Clay Workers' Association and that is the attendance of the machine men. They come here and hear our complaints and troubles and go back to their firms and then the machine house get their experts to working and try to make some contrivance that will overcome the troubles that they have heard through their agents at these conventions. There is another thing. You meet your competitor and tell him your troubles and he will tell you his. You compare notes and help each other in that way.

Mr. Potts: I would like to ask you, Mr. Kennedy, if you have any trouble with the smoke from the kilns when you take this heat for the drier?

Mr. Kennedy: The dampers are in these pipes and are arranged so that you can regulate the draft at your will. The smoke does not affect the color of the brick, although only a small portion of it can get through the dryer. Of course, the men after going into the dryer come out with their faces and hands all black.

Mr. Storm: I would like to ask Mr. Kennedy if he has ever used a car with a jack and using one car instead of a number of cars, such as the manufacturers have been telling us about?

Mr. Zimball: I have used that patent car for a season now. We handle the brick in this way as cheaply. We have an open yard drying system. We have tried it in a shed but it takes so long to dry.

Mr. Potts: Do you use a drier?

Mr. Zimball: We did, but late in the Fall. We do not expect to use it in the Summer time as long as it is drying weather. I remember at the last convention Mr. Vogt had a paper and he recommended a system of a kind entirely against the proposition of Mr. Kennedy. That puts us at a loss to know which proposition to accept.

Mr. Stoll: I can see where a discrimination would be in any kind of a drier with that system for the reason that Mr. Kennedy has a very tender clay. It takes him 72 hours to dry his clay. Mr. Kennedy's system is that one car follows another down the dryer until they get to the hot end.

Mr. Finnegan: This system that Mr. Zimball is using is the Portable Hake?

Mr. Zimball: I might call it a Portable Hake system, but with the latter you do not use the racks at all. You load the brick on the car and have an ordinary truck and do not use the track. These elevated cars that we have run on a track the same as yours in your drier system.

Mr. Potts: I would like to ask if there is any gentleman here who has used the drier, or the waste heat from the kilns for their drier and where they have been making red brick, if there was any discoloration in the surfaces of the brick?

President Wilson: I would say, Mr. Potts, that there is no discoloration by the use of waste heat when you use it after you stop firing the kilns. In our system we do not hook on to a kiln until after we have stopped firing. Of course, once or twice—possibly two or three times—since we started our drier, we got caught for hot air and we hooked on to a kiln before we got through firing and we did not get the best results from it—that is to say—the gases from the fuel got into the drier and discolored the bricks before they were really burned. They did not affect them any but when they came out of the kilns, instead of being clean brick they were discolored.

Mr. Potts: Do you use coal or wood?

President Wilson: Both. I would like to ask Mr. Pratt of the Excelsior Yard of the City if he has any experience along these lines?

Mr. Pratt: Our drier is a steam dryer.

Mr. Kennedy: I hope that this question won't end here. There are a whole lot of questions before us and I am sure that there are many of us here who have had experiences and ideas along these lines and this is the time to let us hear them. If they have been bumped a little bit let us hear from them. I would ask Mr. Pratt

to give us an idea of his steam dryer. It may be of some interest to us.

Mr. Pratt: My experience with steam driers, or hot air driers, is to always see that you have a free circulation. You have to keep the cool end of your drier hot enough to keep the brick from dewing. Sometimes you find the fan is taking the air out too fast and practically drawing it out so fast that you leave a moisture in the brick like dew but when you get about 150 degrees in your steam at the hot end and 100 degrees at the cool we always find it to work better, if the clay will stand that heat. Get about 50 degrees between both ends and get a hot air circulation just as if you had a hot wind.

Mr. Ringle: We have a steam drier and when we bought it we were told that that drier would dry any kind of clay in forty-eight hours. The drier was put in and the man said that it was in good shape and to go right ahead and make brick. We went ahead but found that we could not dry any brick successfully. There was a very large percentage of loss on account of cracked brick. They said there was too much ventilation—too much draft—the brick were drying too fast and all those things. We experimented on that for nearly a year. We finally came to the conclusion that it was cheaper to prepare our clay—mix it to the proper proportion so that it would stand that heat and dry it in the time that we wanted to dry it. We are now careful not to have our clay too fat or too lean and mix it in proper proportions. In this way we can dry our brick in from 36 to 48 hours without any trouble and the only trouble is when we accidentally get a poor batch of clay. We find it is much cheaper to regulate the clay than to regulate the drier.

Mr. Kennedy. Does the clay keep the moisture when it is too fat or when it is too lean?

Mr. Ringle: We have tried it with fat clay and find it takes as much as 72 hours. That does not give any satisfaction. We found that the fat clay would not stand the fast drying so we mixed our clay to the proper proportion.

Mr. Kennedy: I would like to ask Mr. Ringle, how much did your brick shrink from the time of leaving the moulds until they left the drier?

Mr. Ringle: About three quarters of an inch.

President Wilson: I do not think Mr. Kennedy that you take the amount of moisture that is in a brick after it leaves the machine into consideration. There is a vast amount of water removed in the process of drying.

Mr. Kennedy: Mr. President, have we left the impression on the mind of this convention that the drier is not a profitable thing. Maybe the machine men here feel that we have stepped on them. I do not feel like that. The man that made the machine to dry those brick will dry them, but the man that is sent out on the road to sell that machine is no more fit to tell me how much heat and how much air is required to dry them than anyone. He cannot tell me how many units of water there is in a brick. There is this much about the drier. If it is properly handled—and I think I can say it without being contradicted here—that you can get your brick thoroughly dry, burn less fuel, have less flashed on your brick, keep a better lot of men, start earlier and run later in the season. You can depend on your output and know how many brick you are going to turn out.

President Wilson: I presume it will be in order to make some mention what we, the Menomonie Hydraulic-Press Brick Company, are doing, but inasmuch as I hope to have the pleasure of all of you visiting our plant in the morning, I do not believe any statements are necessary at this time. We will have our drier in operation and it speaks for itself. You can see more in a minute what it is doing than I can tell you in an hour.

President Wilson: The next number on the program will be a paper by Mr. Harry de Joannis, Chicago, Ill., on "What Constitutes a Modern Brick Plant."

WHAT CONSTITUTES A MODERN BRICK PLANT.

The requirements of a modern brick plant are co-ordinate with the character of its product and its capacity. It would be impossible

to lay down a series of rules to which all plants should conform, and anything that can be said on the subject should be rather presented in the general sense than in a particular sense.

The chief requirement for a modern brick plant is a visible and capable head. Up-to-date machinery, fireproof buildings, excellent and abundant clay, and good market for the products made from it, are all in danger unless at the head of the enterprise is a man who, as stockholder in the Company or as actual proprietor, shall give to the plant a large share of intelligent attention. Pitiable, indeed, is the condition of any enterprise whose interests are placed in the hands of an employee only. Not that the employee or superintendent is incompetent, but, not having a personal or vested interest in the enterprise he lacks the one quality which is most needed. Such a head should have a capacity larger than the plant, in the same way as every part of a plant's equipment should exceed in capacity and strength the demands to be made on it.

In reviewing briefly the physical, mechanical and commercial requirements of a modern plant, it is to be assumed:

First. That the choice of the clay has been made wisely.

Second. That the raw material is excellently adapted for the manufacture of the product which the plant is designed to produce, and preferably such clay deposit should be of a character as to fit it for the manufacture of kindred clay products which might be demanded subsequently by the needs of a growing market and for the successful industrial extension of the enterprise.

Third. The clay deposit should be extensive, and capable of supplying the plant with a uniform material for a given number of years, which will guarantee under general market conditions a reimbursement of the capital expended and a satisfactory profit throughout all these years to the investors.

Such clay being at hand, adequate shipping facilities are next essential, and the plant itself should be within easy reach of the market for its products. I refer, of course, to the common building brick plant, which naturally offers the most restricted market from a shipping point of view. Face brick, paving brick, sewer brick, fire-brick and glazed brick are capable of being shipped to greater distances, distances commensurate with their quality. Other essentials are good water and coal. The water should be plentiful and comparatively pure, to prevent scale in the boiler and efflorescence in the finished product, the latter deficiency being the most injurious to the commercial future of the enterprise. The fuel should be procurable at a limited cost, within a reasonable distance and a reasonably prompt delivery. To the brick maker, the fuel represents more than half of his manufacturing cost.

Add to these essentials the requirements of a steady and growing market, without which the plant has no reason for existence, and we are able then to glance at the essentials of the plant construction in order that the product may be produced at the lowest possible cost.

The judicial selection of the location of the different parts of the plant is very important. Every advantage should be taken of gravity in the successive stages of the manufacture of the brick from the clay pit to the railroad cars. Furthermore, the plant should never be constructed with a view to fulfilling merely the immediate requirements of its initial capacity. Many plants are to be seen throughout the country which bear witness to a deplorable lack of foresight in their initial construction. A plant is built for a 30,000 daily capacity; it is well managed; the business prospers; its market increases; and subsequent additions are made under pressure of a growing business, regardless of future expansion and with no thought, or little thought, of the preservation of the unity of the plant's manufacturing processes. A kiln is added here and a drier there; an extra machine is installed in one position and a second in another, and in the course of years the plant becomes a heterogeneous operative aggregate without intelligent formation and devoid of economical function. I have in mind such plants, where the losses in operation at the present time are very great, and whose success in maintaining the right of existence depends only upon the excellence of their products, their profits being cut in half by the lack of uniformity and development. When the subject is referred to, the proprietors admit that things might be better, but point out

that a reconstruction on economical lines is impossible because of the enormous cost involved and the delays which would be occasioned by such reconstructive work. It is far better when the plant is young and can be easily moulded, that expert advice should be taken and plans drawn by which a steady increase of business can be taken care of without the disturbance of a single element in existing conditions. Plans cost but little, comparatively, to draw up, but additions without plans are expensive experiments.

The modern brick plant should perform all its operations at the least possible cost consistent with its capacity. The pick and shovel, and the cart and horse should often be superseded by a steam shovel and an industrial track system years before they are. Manufacturers allow a decade to go by without discovering when they have stepped over the line of economical mining of their clay. This clay bank is worked farther from the plant each year, and the character of the clay varies, and still the old time methods are pursued and it is considered a small matter to add a man and a horse—simpler, indeed, than figuring out the additional cost entailed in the mining of the raw material and comparing it with the cost to install and operate a steam shovel.

Many plants should be benefitted by the erection of a storage shed for clay, which would render them independent with wet weather conditions. By a storage shed, I do not mean the apology of one that is often seen—a leaky roof supported on drunken posts, and covering only enough raw material for three or four days' run. It should be a leak shed, protected from atmospheric conditions from all sides, and containing enough clay to run the plant for a month at least and longer where the market demands are excessively large.

While talking about shed construction, a few words on the character of the construction of a plant's buildings can not be amiss. These should be of brick or hollow block, and practically fireproof throughout. Such construction is more costly to the tune of five or six thousand dollars perhaps, but a modern plant is built to stay. The business is intended to develop, and a profit is desired not only during the first ten years, but during the remaining forty if fifty be taken as the life of the clay working plant and its clay bed. Frame buildings are costly to keep in repair. The frost and the sun cause them to deteriorate rapidly, and their inflammable nature is not questioned. A spark on a frame building is sufficient to commence a work of devastation which will wipe out in an hour the result of years of toil, ruining machinery which is expensive and takes time to replace, and delaying the resumption of operation to such an extent that the business lost becomes fresh business to regain. Once a man gets out of the way of paying you money, you pay dearly to get him back. I would emphasize as an essential of modern brick plant construction, fireproof buildings. If the buildings are already of frame, reconstructive work on a fireproof basis can be and should be undertaken steadily without delaying in any appreciable measure the plant's manufacturing operations. The safest insurance is an investment of this character.

The boiler-and-engine-room should be shut off from the rest of the plant to prevent the entrance of dust and grit, and should be the cleanest place in factory. An essential adjunct to the boiler-room is a feed water-heater. The boilers and steam pipes should be covered, to prevent radiation, and no steam-saving device should be considered of too small importance to receive your attention. A heater prolongs the life of a boiler and increases its steaming efficiency. I would strongly advise the installation of mechanical stoking devices in the boiler-room. These have now got beyond the experimental stage and the smokeless boiler stack is no longer a possibility, an ideal to be attained, but an accomplished fact. The saving of from 25 to 35 per cent of fuel is not to be disregarded by any sensible business man. Especially would such a device be valuable where the drying of brick is accomplished by the drawing of waste gases from beneath the boiler into the drier, or when they are tapped from the base of the stack for the same purpose. Expensive? Nothing good can be bought for nothing. You say you cannot afford it. That is a different proposition. But that is where planning is necessary. Once you are convinced that any apparatus

would be an advantageous installation on your plant, set aside a definite sum at intervals until it can be effected. In these days of strenuous competition, the smallest saving should receive your greatest attention. As regards the machine-room proper, speaking biblically I would say "Let there be light." Too often machine rooms on clay working plants are in a state of chimerian gloom. True, windows have been provided, but they are of bath-room size and are never cleaned, and if there is a piece of lumber laying around the window is considered the right place to lean it up against. Plenty of light is conducive to alert, intelligent operation. Obscurity stultifies the operative sense and tends towards sluggish physical movements. As regards the machinery beyond saying that the best is none too good, it is not for me to say anything. Every machine is supposed to be like Caesar's wife, "above suspicion," and I have too many friends among machine men to endeavor to establish comparisons. Before leaving the machine-room, I would make one point, however; that the room be provided with a floor, and that this floor be kept clean. Some machine rooms have the appearance of a scrap heap, above which the machine belches forth a column of clay, the division of which into bricks and their safe transportation to the drier is a perpetual miracle, the whole plant being like the rocky road to Dublin! Broken brick, slabs of clay, parts of discarded drier cars, loose wheels and gears litter the floor in every direction and in graceless confusion, and the employees' work is largely in accordance with the machine-room atmosphere.

The modern drier should also be fireproof and of substantial construction. Its tracks should be solidly bedded and its doors permit of easy ingress and egress for the drier cars. The operation of the drier should be superintended intelligently, the co-operative use of thermometers and hygrometers being desirable, so that the work being done in the drier can be gauged at all times. I am convinced that little is attempted in the way of reducing the cost of drier operation by a study of drier conditions.

As to the kilns, these should have substantial foundations, provided with adequate drainage facilities. Their construction depends largely upon the character of the wares desired and the uniformity of the product hangs on the intelligence of the burner. No matter what type of kiln is used, the essentials are a good draft, uniform fuel, grate efficiency, regular firing and furnaces so constructed that provision can be made for the mixing of the requisite amount of air with the volatile gases. It would be better if all the kilns of the plant were covered in, so that the kilns and the coal which will be burned in them shall be protected from weather conditions. In all additions and improvements made, except engineering advice should be sought and bought and plans should be drawn and carefully scrutinized before any work is undertaken.

The modern plant should have its operative area paved, even if such paving is done with bats of the plant, so that workmen can get to any part of the plant with ease, independent of weather conditions and changes. Water courses should be provided to carry away the water during the rainy seasons. Last, but not least, every plant should have a carefully kept up cost system, by which the cost of every stage of manufacture of the product can be ascertained at any time and extravagances in any given direction may be done away with. It may be adduced that the keeping up of any cost system involves additional work, and that it is difficult to get the hands to fall in with such new ideas, but times are changing and the old slipshod methods must disappear. The brick making business is a business proposition; guess work must be eliminated, and no plant can be run today successfully without the same care being given to it in this regard as is given to operative costs in the other leading industries of the country.

Mr. Potts: I cannot add very much to Mr. de Joannis' paper, but I would like to help Mr. de Joannis to impress upon every brick maker that there cannot be too much care in the steam equipment, erection of buildings, machinery, setting up a clay warehouse. Concrete foundations are essentials in buildings and concrete supports for the shafting will be found of little more expense than lumber. In this way your steam gear will never get out of line or out of level. Keeping up a cost system is also of vital importance. It is

very necessary for every brick maker to know just what his brick cost him in the manufacture.

Mr. Frazer: Mr. President, I do not believe I can add anything to that paper. I can only say what Mr. Potts has said. And, if the brick makers throughout the country would read that paper carefully, it would help them. It may be overdrawn a little where the small brick makers are concerned. In the construction of a plant it is certainly better to spend a little more money in the beginning than to have to spend a great deal afterwards.

President Wilson: I would say, gentlemen, that Mr. de Joannis has covered the ground very thoroughly, indeed, and inasmuch as we have one new member who has been kind enough to come to our convention and who is contemplating building a plant, I trust he has found something in this paper that will help him. We would like to hear from him.

Mr. Crabtree: I do not know as I can say much, as I can say anything, but I will say this. I came here a tenderfoot. I did not know anything about the business and I don't know much yet, but I have met, gentlemen, a very nice class of men, indeed, and as I knew nothing about the men interested in the clay manufacturing business before, I am very pleasantly surprised. They seem free to tell anyone all they know about their business. In other lines of business it is very hard to get any information. Generally when you go to a man and ask him about his business and intimate that you may be a possible competitor of his, he will generally shut up like a clam, but I do not find the same case here, and while I intend to go into the business in the near future, I won't know much about it until I have had experience as I have learned from these gentlemen that have paid for their experiences, but I do say that I have obtained a great deal of information from these proceedings and from what I expect to see around town here. It will help me vastly and I hope it will be possible for me to attend your conventions again. We cannot make any too many friends. The more men we meet; the more we go out, and the more willing we are to impart information to one another, we are that much ahead, and it is not very expensive. I want to thank those gentlemen here who have volunteered their information to me when I have asked for it today and I think I shall bear down a little harder tomorrow. I have been helped a great deal by these discussions—especially the papers that have been read. I have got a whole lot out of it and if it ever comes my turn to help out when I have learned more, I shall be willing to give anyone what they can get out of me.

Mr. Kennedy: There is one thing that Mr. de Joannis has already taken up in his paper and that is the itemized cost of each branch of the business. There is too little attention paid to that. We find it every day. A man should know just what each branch of business costs him per thousand of brick in order to intelligently place a fair valuation on his product. In reading the "Brick," I notice this question was taken up very extensively by the National Convention. This itemized cost must be kept up every day. If you let it go by for a week, it is a hard job to pick it up again. If you have no time to do it yourself, hire a bookkeeper to do it for you and most of us employ bookkeepers anyway—make him do it. When you get the bills for material bought for any specific purpose, find out what the material the bill covers is for and place the amount against that item, so at the end of the season you will know just exactly what that item has cost you during the season. You can find just what the expense per thousand for that item has cost you. In this way you can find out just what it costs you to burn each kiln of brick—how much for coal and how much for wood and how much for the labor. The trouble today is that when a job is in sight and the contractor comes to you and asks you for a price on brick, you give it to him, but he says he can buy the brick a little cheaper from the other fellow. Well, you say if he can sell them for that I can too and that you can make brick just as cheap as he can. But, do you know how much it costs you to make brick? You meet the man's price, but you don't know whether you have made any money on the brick or not.

Mr. Crabtree: There is one thing that I have heard more or less about and that is where a tender clay is used that causes the

brick to crack in the drying, if by using sand it reduces that difficulty. I do not gather anything of this kind today, and I would like to know about it.

Mr. Kennedy: Yes, we use sand.

Mr. Crabtree: What proportion do you use?

Mr. Kennedy: That is gauged by the clay you are using. If the clay is very fat, you use more sand; you determine that by the way your brick slip from the moulds and by the knowledge you have of the clay when it is prepared before it goes into the moulds.

Mr. Crabtree: What kind of sand do you use?

Mr. Kennedy: Bank sand. I would prefer lake sand.

Mr. Crabtree: Is the sand sifted in any way?

Mr. Kennedy: If there are any stones or pebbles in it it certainly must be sifted or screened.

Mr. Stoll: Regarding that last question: We did a great deal of testing of clays at our factory. I kept a memorandum of one test that we made for a man in Dubuque, Ia. They had a very strong clay, which cracked very badly in the drying. They had to keep their brick in closed sheds for four weeks before they would be dry. They did their drying in sheds but they had to keep their doors down and kept them there for four weeks. They wanted a drier, but we would not recommend a drier to them, but they sent some clay to us. We first tried one per cent of sand for every five pound brick and the next morning, carrying only 90 degrees, the brick cracked, and when we put in 5 per cent of sand they would still crack. We then put in 10 per cent of sand and they still cracked. We then tried 15 per cent and when we got to 20 per cent we could dry them in 24 hours. It all depends upon what kind of clay you are using.

Mr. Crabtree: In using 10 or 15 per cent of sand, is it perceptible in the brick?

Mr. Stoll: No; you would not notice it.

Mr. Finnegan: We have about one-fourth shrinkage in our brick by using sand.

Mr. Crabtree: In using additional sand to prevent the brick from cracking in the drier, does this cause the brick to dry quicker than it would without the sand?

Mr. Finnegan: In our experience by using the sand, the brick dry a little slower, if anything. We dry our brick in sheds on pallets, and we find by using sand they dry a little slower but they dry better.

President Wilson: We will take up "How to Overcome the Difficulties that arise in the Manufacture of Brick," by F. L. Sanborn of Portage; he is absent and I will ask Mr. de Joannis to read for us.

HOW TO OVERCOME THE DIFFICULTIES THAT ARISE IN THE MANUFACTURE OF BRICK

There are plenty of men here who have had more experience with different clays, and are better fitted to write on this subject than the writer is, as I suggested to our Secretary when asked to write on this subject, that this should be given to one who has had a wider experience in the manufacture of brick than we have had. We have had only one kind of clay to deal with during the time that we have been manufacturing brick so our experience is not at all varied.

From the time that the Hebrews, under Pharaoh's taskmasters were compelled to gather straw for their tale of brick until the present time, there have been difficulties to overcome in the manufacture of brick; although we do not have the straw problem to deal with as did the ancient Hebrews, yet every brick manufacturer will be witness to the fact that there are problems to be solved in the successful manufacture of brick even in the beginning of the twentieth century. In our own State there are such a variety of clays which must be handled differently in the manufacture as well as in the burning, to produce a product that will stand the test that is required at the present day.

Until we learn from experience as to the nature of the clay that we are handling, we are unable to get the best results, and in fact often sustain heavy losses from our ignorance as to the proper

method of handling it in the manufacture, as well as in the burning of it.

Our clay is of a yellowish gray color; our bank is about 16 feet high and interstratified clay and sand in about the right proportions, so that all our material comes from the same bank, which we find to be of quite an advantage.

Our clay containing a large percentage of silica it requires a very high degree of heat to burn it properly, requiring five or six days to burn it after the watersmoke is off.

When we first began the manufacture of brick we had a large proportion of soft brick. At first we burned in a scoved kiln, using wood entirely as a fuel, settling our center first and then burning the heads. The consequence was that we often found the heat drawing to the center so that we could not settle the heads properly. To overcome this trouble we adopted the plan of burning the heads first, that is, as soon as the kiln was dry, we closed one side and burned that head for twenty-four hours, then changed to the other head for the same length of time, continuing this until the heads were sufficiently down, that is, changing at the end of twenty-four hours. In this way we have been able to get the heads down properly, and almost invariably the center was low enough when the heads were down, so we did not need to spend any more time and money in settling the middle.

In increase the proportion of hard brick, we built permanent walls for our kilns twenty inches thick at the bottom and twelve inches thick at the top. We also put in grates and burned coal in the mouth of the arches. This we found not only increased the percentage of hard burnt brick but it very materially improved the quality of the arch brick, so that we could ship a very large proportion of them where heretofore only a small part of those brick were good, merchantable brick.

For several years after we began the manufacture of brick we dumped them on the yard to dry. During this time our losses were quite heavy from cracked brick, as well as from storms which spoiled them before they were dry enough to put in the hack. To overcome this loss we adopted the shed and pallet system, which proved to be a great saving in this direction.

Of late we have been throwing lumps of coal into the center of our kilns with the slides which we have found gives good results when the kiln is ready for a settling heat.

The great cost in burning Wisconsin clays in comparison with those found in other States about us is of course detrimental to the interests of Wisconsin manufacturers, as we are obliged to compete with brick outside the State that can be burned at a very much smaller cost. Especially is this true of Chicago brick which are being shipped into this State on a low rate of freight in addition to the small cost of burning. This is one of the obstacles that we are up against that it seems very hard to overcome. The matter of distance does not seem to cut much figure with their prices. They offer to furnish their brick at a station 221 miles from Chicago at the same price they charge for them 166 miles from Chicago.

A Wisconsin brick manufacturer who was figuring on a job at a point in Juneau County was told by the contractor that it did not make any difference how low a price he named, he could get the Chicago brick for five cents per thousand less.

Whether our rate commission will be able to do anything for our relief remains to be seen. I have no doubt but what some action will be taken by this Association at this meeting to bring this matter to the attention of the Rate Commission so that we may know in the near future whether or not they will be able to do anything for our relief. To meet this competition the brick makers of Wisconsin must adopt any new methods that will decrease the cost of manufacture and improve the quality of their product.

It seems to us that if the brick manufacturers of Wisconsin would stand together and refuse to furnish face brick to be used in connection with the Chicago brick that the demand for Chicago brick in this State would be very much less than at the present time.

Question by Member: Cannot the addition of a large amount of silica reduce the cost of burning?

Member: Mr. Sanborn's paper says not.

President Wilson: I would ask Mr. Lowater of Spring Valley what his experiences along these lines are.

Mr. Lowater: We have two distinct kind of clays—a very tough clay on top and silica underneath. If we do not mix them properly we have trouble.

Mr. Finnegan: All of the brick that are shipped from outside of Wisconsin to points in our territory are common brick and have to be faced with good Wisconsin brick. Now, if we would all get together and refuse to cover any Chicago brick, I believe in this way we could keep them out. We have the general weakness and that is to do business. Most of us have to sell our brick when we can and there is some excuse for us and we are obliged to take our medicine on account of the rates. The same thing applied to sand lime brick shipped in from Michigan. If we simply stick together in this matter and when a contractor comes to us for face brick, ask him "what are you going to lay on the inside?" and if he tells you it is Chicago brick or sand lime brick, tell him that you are out of the face brick. I think in this way we could sell all of our product provided all the brick makers in this State would do the same thing.

Mr. Kennedy: I think we need not lose any sleep on this phase of the question. Right here in Menomonie you have an example of it. You would not consider for one moment that you would be able to ship your brick all over the country if it were not to face some one else's brick.

Mr. Ringle: There has been some discussion with reference to mixing sand and other material in the clay. We have used brick bats and ground them up and find them equal to sand or anything else. All you have to do is to get a little machine, grind your bats, and it serves the same purpose as the best of sand.

President Wilson: It is now getting along toward the time when most of us may want to get ready for the banquet which is at 6:30. The Commercial Club of Menomonie extends to all of the members of the Wisconsin Clay Workers' Association a hearty invitation to partake of this Banquet. I wish also, gentlemen, in this connection, to extend the same invitation to the exhibit held by the Women's Club of this City—the arts and crafts exhibit—which is being held just one block from here at the Mabel Tainter Memorial. This represents an exhibit of Menomonie industries. I hardly know now when we shall have an opportunity to visit this exhibit, but I hope we may be able to figure out some time tomorrow for fifteen or twenty minutes to visit this place because they have a great many interesting things to see. The trip in the morning to the local yards is scheduled to leave the hotel at 8:30. This has been somewhat revised and it has been arranged to visit the local yards by a train instead of wagons or sleighs, which was originally planned. It will be somewhat difficult for us to get the train to come to the hotel and I will ask the members to walk to the depot which I hope most of you will be able to do in the morning, the train will leave the depot about 8:30.

It was moved and seconded that the Convention adjourn until Friday afternoon.

MEETING OF THE OHIO BRICK AND TILE ASSOCIATION.

A meeting was recently held at Star hotel Monday, Columbus, O., of about 35 members of the Drain Tile and Brick Manufacturers' Central Ohio Association, for the purpose of discussing trade conditions and the prospects of the future for their line of manufacture.

H. C. Black, Plain City; J. E. Lanman, Centerburg, and Lafayette Mentzer, Kenton, were appointed a committee on prices, and S. Van Cleve, South Mansfield; W. C. Wilson, Brice, and J. W. Snyder, Millersburg, a committee on railroad rates.

During the afternoon session H. C. Black delivered an address on the Valentine act, which prohibits the formation of trusts or combinations to maintain prices or to destroy competition.

THE PACIFIC NORTHWESTERN CLAY- WORKERS' ASSOCIATION.

Under the name of the Pacific Northwestern Clayworkers' Association, a majority of the brick and tile, sewer pipe, pottery and terra cotta manufacturers of the states of Oregon, Washington, Idaho, Utah and Montana have completed organization for mutual benefit and protection. Fifty-four manufacturing plants were represented by delegates to the convention, which was held in the rooms of the Chamber of Commerce at Portland, Oregon, and 62 others who had not secured personal representation at the organization meeting were admitted to membership on their written requests.

The organization of the association is the result of a campaign which has been carried on quietly but effectively for the past six months by the leading manufacturers, who have long felt the need of a closer union of those engaged in the

Miller, Seattle, Chairman; L. E. Kern, Portland, and G. W. Bates, Portland.

List of members:

James Anderson	Portland, Oregon
Clinton S. Barlow	Tacoma, Wash.
Geo. W. Bates	Portland, Oregon
E. C. Belknap	Portland, Oregon
Frank P. Birrer	Dillon, Mont.
Robt. P. Bradley	Tacoma, Wash.
C. H. Brey	Helena, Mont.
C. A. Brown	Palouse, Wash.
A. A. Burton	Salem, Oregon
B. F. Catching	Forest Grove, Oregon
W. C. Corbett	Corvallis, Oregon
J. T. Davie	Spokane, Wash.
A. T. Dishman	Spokane, Wash.
O. K. Edwards	Newburg, Oregon
J. H. Evans	Spokane, Wash.
Chas. Fisher	Milwaukee, Oregon



Officers of P. N. C. W. Association in front row—Frank A. Lathrop, A. M. Smith, Geo. W. Bates, R. P. Bradley, L. L. Haynes, L. E. Kern.

clayworking industries, states a Portland report. Though no delegates from those states were present it is the intention of the association ultimately to bring into the organization manufacturers in California and Nevada and include as nearly as possible all plants west of a north and south line drawn through Salt Lake City.

The officers were elected for the first year as follows: President, A. M. Smith, of Portland; vice presidents, R. P. Bradley, of Tacoma; L. L. Haynes, of Lewiston, Idaho, and L. E. Kern, of Portland; secretary, Frank A. Lathrop, of Portland; treasurer, G. W. Bates, of Portland.

The above officers and J. H. Spear of Spokane, R. H. Miller, Seattle, and W. F. Hidden, Vancouver, are the Executive Committee of nine. The committee on Railroad Rates are John Megrath, Seattle, Chairman; R. P. Bradley, Tacoma, and G. M. McDowell of Portland. Committee on Farm Drainage, J. E. Murphy, Salem, Oregon, Chairman; Phil. Withycombe, North Yamhill, and J. M. Martin, Eugene, Oregon. Committee on Uniformity of Sizes, J. R.

J. F. Garrett	North Yakima, Wash.
J. G. Hammer	Butte, Mont.
L. L. Haynes	Lewiston, Idaho
W. F. Hidden	Vancouver, Wash.
F. P. Hobkirk	Portland, Oregon
A. C. Hollenback	Missoula, Mont.
B. F. Hoover	Portland, Oregon
J. T. Huetter	Spokane, Wash.
Theodore Jensen	Portland, Oregon
A. Kalk	Portland, Oregon
L. E. Kern	Portland, Oregon
Frank A. Lathrop	Portland, Oregon
F. Lehman	Portland, Oregon
C. R. Littell	Littell, Wash.
M. F. Loy	St. Johns, Oregon
J. M. Martin	Eugene, Oregon
G. M. McDowell	Portland, Oregon
John Megrath	Seattle, Wash.
J. R. Miller	Seattle, Wash.
J. E. Murphy	Salem, Oregon
C. W. Nottingham	Portland, Oregon
C. P. Oudin	Spokane, Wash.
Victor Randles	Portland, Oregon

Ed. J. ShawSeattle, Wash.
 Jacob SietersMcMinnville, Oregon
 Amadie M. SmithPortland, Oregon
 Blaine R. SmithPortland, Oregon
 J. H. SpearSpokane, Wash.
 G. M. SwartwoodPalouse, Wash.
 Alph. Van HoomissenPortland, Oregon
 Marion VersteegPortland, Oregon
 A. N. WillsPortland, Oregon
 Chas. H. Williams.....Spokane, Wash.
 Mr. WingardCentralia, Wash.
 Phil. WithycombeNorth Yamhill, Wash.

Honorary members:

"Clay Record," semi-monthlyChicago, Ill.
 "Brick," monthlyChicago, Ill.
 "Clay Worker," monthlyIndianapolis, Ind.

After the meeting the delegates were taken out to inspect the Randel & Kinsey clay plant at Sylvan, and later were given a banquet at the Commercial Club, at which Governor Chamberlain spoke, and brief addresses were made by H. M. Cake, president of the club, on "Our Prosperity," and Paul Shoup, assistant general freight agent of the Harriman Northwest lines, on "The Clay Industry from a Railroad Point of View"; Samuel Connell, "The Value of Association"; George W. Bates, "The Two Banks—the Clay Bank and the National"; J. E. Murphy, of Salem, "The Question of Freight Rates Relative to the Industry"; Clinton Barlow, Tacoma, "The Clay Business from an Agent's Point of View"; J. Megrath, Tacoma, "The Value of a Uniform Size of Brick," and L. L. Haynes, of Lewiston, on "The Tenderfoot."

KENILWORTH TILE COMPANY TO BUILD IN NEWELL

The Kenilworth Tile Company, East Liverpool, O., is the name of the company that will erect a plant at Newell, W. Va., opposite East Liverpool, O. The location of the plant will not be definitely stated by the members of the company, because they have not been able to secure all the arrangements in regard to shipping which they deem necessary.

The contract for the buildings was let at a recent meeting of the members of the company, and they reserved the right to lay their own foundations. These will probably be of concrete and the building of the factory and kilns was awarded to Messrs. Gamble & Surles.

The location in Newell is directly east of the new pottery which is now in course of construction. This is the location that will be taken in case the factory is located in the new town and there is little doubt but that it will.

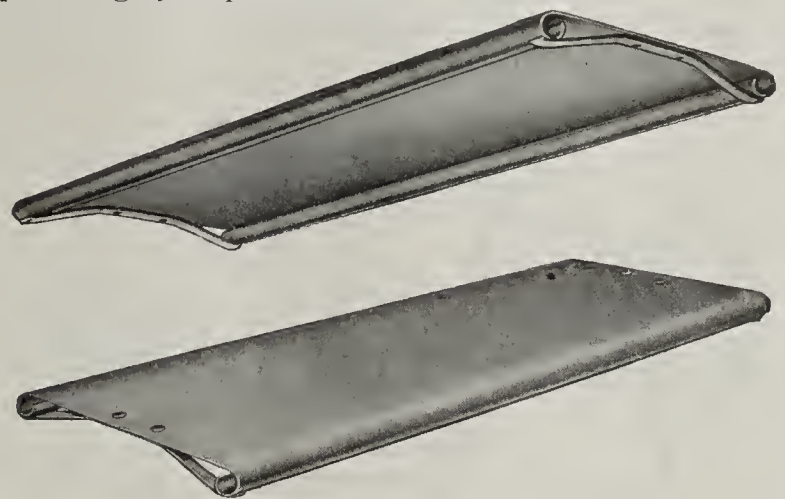
Several other sites have been offered, but the Newell proposition meets with general approval. The plans call for a building 200x100 feet and for three kilns. Fancy tile will be the chief product. The company will be incorporated within the week.

Those interested in the company are: R. L. Cawood, of the Patterson Foundry and Machine Co.; Hart T. Hall, Cashier of the Dollar Savings Bank; J. A. May, of Cartwright Brothers' Pottery Co., and S. C. Williams, of the Williams Lumber and Stave Company. J. A. May will be the manager of the new plant.

AMERICAN STEEL PALLETS ON RUNNERS.

The subject of pallets is one in which every manufacturer of soft-mud brick is interested. We are illustrating in this page the latest comer in the field, a wrought steel pallet which is made by the American Pulley Co., of Philadelphia, Pa.

The particular feature of these pallets is that they are supplied with runners. These stiffen the pallets, and also provide a surface upon which to slide them into the racks. Friction is reduced to a minimum, and it is not necessary to lift the pallet to prevent the outer edge catching on the edge of the rack. All that has to be done is to push the pallet. The yard of John H. Earley, in Philadelphia, of which a trade journal says that it is the most modern in that city, is equipped with these pallets, and Mr. Earley speaks highly in praise of them.



PATENT APPLIED FOR

The American Pulley Co. is well known as the makers of the celebrated "American" All Wrought Steel Pulleys, of which they sell about two hundred thousand a year. They are, from their experience, most admirably equipped for the manufacture of such an article as steel pallets, and we do not hesitate to say that any one dealing with them can depend on getting good, honest workmanship and material, and a full dollar's worth.

IMPROVEMENT AT SOLFISBURG BRICK WORKS.

Many improvements have been made at the Solfisburg brick works, Aurora, Ill., during the past winter and a new lot of machinery has been installed. Electricity will replace steam as a motive power.

New brick machines, crushers and elevators, have been added and clay sheds built. The style of making brick has been entirely changed and the yards have been entirely remodeled.

Brick is now dried in the open air, but next year drying machinery will be installed, and further improvements made.

Work will be started for the season in a few days. Twenty-eight hands are employed and clay is hauled a distance of a mile and a quarter. Thirty-five tons are used each day.

The name of the firm has been changed to C. Solfisburg Sons, A. C. and Lincoln Solfisburg running the business, leasing it from their mother.

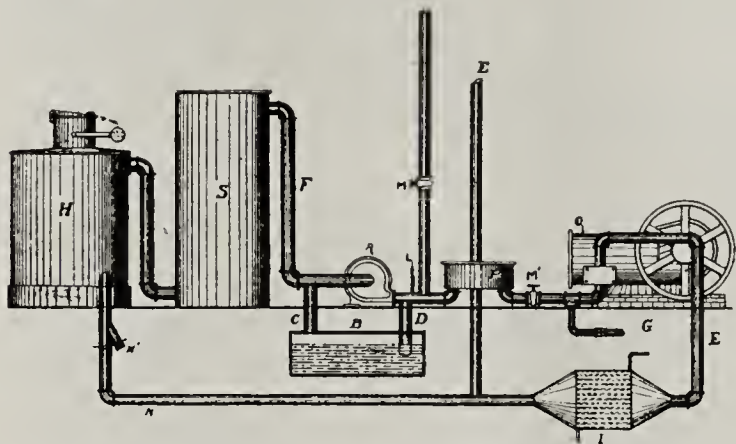
NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

810,022.—Method of Producing Vitrified Brick, Tile, and Various Shapes. Ralph Baggaley, Pittsburg, Pa. Filed Dec. 23, 1903. Serial No. 186,335.

Claim.—The method herein described of utilizing the silicate-of-iron slag from copper-smelting furnaces for the production of vitrified articles, which consists in flowing the molten slag into molds to completely fill the same, confining the slag at the rapidly-cooling marginal portions of the mold in closed molds, and applying pressure to the central hotter portions of the slag, and subsequently cooling and annealing, substantially as described.

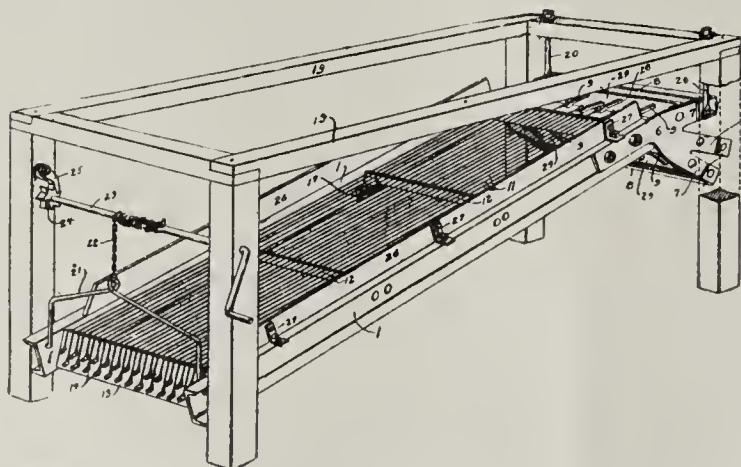
810,685. Power Gas Apparatus. Godfrey M. S. Tait, Montclair, N. J., assignor to Combustion Utilities Company, New York, N. Y., a corporation of New York. Filed Oct. 21, 1905. Serial No. 283,839.



Claim.—A combination of a suction-producer; an internal-explosion engine; a connecting-conduit; interposed in said conduit a fan-blower having a liquid-seal by-pass, whereby gas may be delivered under a constant predetermined pressure to the engine, substantially as described.

Power gas apparatus which comprises a gas-producer; an internal-explosion engine; a connecting-conduit; a mechanical draft appliance interposed in said conduit, and a water-seal by-pass around said mechanical draft appliance, whereby producer-gas is delivered to the engine under constant predetermined pressure.

810,682.—Sand or Clay Screen. Lemeon P. Shafer and Charles Devis, Canton, Ohio. Filed April 3, 1905. Serial No. 253,611.

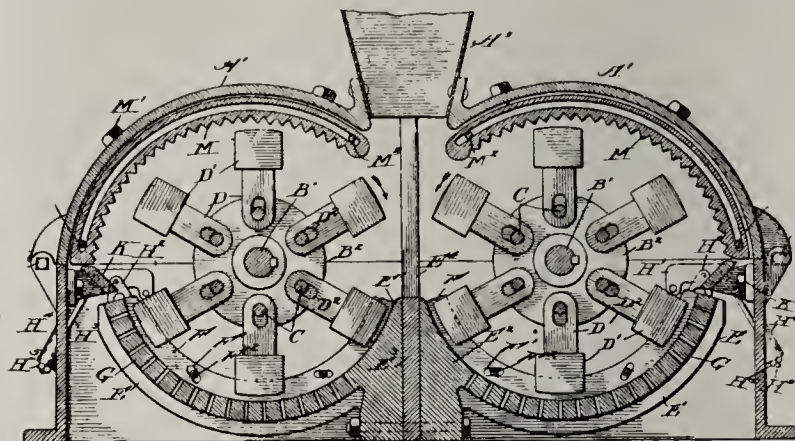


Claim.—In a screen of the class described, the combination of a suitable frame, consisting of side members and tie-bars, heads carried by the frame, said heads provided with tension-bars and the tension-bars located in different horizontal planes, wire-holding bars secured to said tension-

bars and independently adjustable, a series of screen-wires secured to the independently-adjustable holding-bars at one of their ends and their opposite ends secured in fixed position and means for holding the screen-wires in spaced relation to each other, substantially as and for the purpose specified.

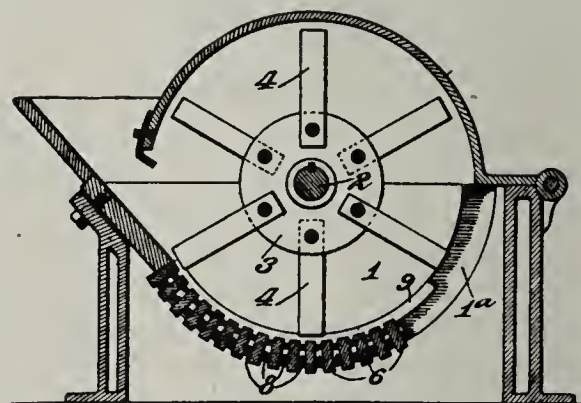
811,671.—Crusher. Peter L. Simpson, Chicago, Ill., assignor to Herbert S. Simpson, Chicago, Ill. Filed Feb. 26, 1902. Serial No. 95,656.

Claim.—In a crusher, the combination with hammers, and means for rotating them about adjacent centers, so as to crush material between them, of means for inserting material between said hammers, so that it will be crushed, a dividing-block located beneath the points of nearest approach of hammers to each other, and grate-bars extending in curves from said block and underneath the axes of said hammers.



The combination with a casing, a pair of parallel shafts, and pivoted hammers carried by said shafts, said casing having an opening located between and slightly above said shafts, of a dividing-block located between and slightly below said shafts, concave grate-surfaces extending in opposite directions from said block under said shafts, and concave corrugated surfaces extending in a similar manner from said opening over said shafts.

811,679.—Cage from Crushers and Pulverizers. Milton F. Williams, St. Louis, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo., a corporation of Missouri. Filed Jan. 14, 1905. Serial No. 241,101.



Claim.—The combination with a support having a curved groove, of cage-bars having reduced ends projecting into said groove whereby shoulders are provided on the cage-bars adjacent to said grooves, a ring-mount co-operating with said shoulders, and means independent of said ring-mount for holding the cage-bars spaced apart, substantially as described.

The combination with a support having a curved groove, of cage-bars which extend into said groove, and means separate from the cage-bars and adapted to be inserted in said groove for changing the radial distance of said cage-bars from the center of the support, substantially as described.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII.

MARCH 30, 1906.

No. 6

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

Let some one else do the bragging. It sounds better.

Never put off till tomorrow the meanness you can cut out today.

Consider well before you begin; when you have decided, act promptly.

Keep going. The inspiration that comes to a busy man is the one an idle man waits for.

THE CLAY RECORD is the only semi-monthly paper in America. It don't claim the earth, but is satisfied with a small portion of it. What it claims it makes good. In the March issue of another clay journal appeared articles that were in THE CLAY RECORD two, four, eight issues ago. All stale now. It costs only one dollar to be up to date.

No country, since the world began, so far as history's record goes, was favored as this country has been, and its wonderful and phenomenal growth and prosperity have produced a strange and, were it not a serious matter, an amusing effect upon the people. The opinion is generally held that we know it all, that nothing can be learned from any source, whatsoever, and the opinion is held without

any attempt by comparison with other countries to honestly determine whether this be or not be the fact.

We have schools and colleges, and yet only a superficial examination of the work done by them reveals a waste of time and energy and the results produced anything but satisfactory. Our plea is that too much time is spent in school; that the pupil should have more to say about, if not permitted to choose, his own line of studies. Now we are not arguing this for a boy at five years of age, whose preference at that age would be to become a street car conductor, but our plea is for boys twelve years of age and older. Our boys, the larger majority of them, if we had the Technical High Schools such as are found in and crown the German system of industrial education, and forms the noblest monument to the deep thought, untiring energy, and unquestionable enthusiasm of German educators and statesmen in this field, our boys, the majority of them would take up an industrial education and become deeply interested in the application of science in industry.

This country wants the "real" or scientific school that the young lads may prepare themselves for a higher technical education; it is overrun with the lawyer, the clerical professional and the multitudes whose studies were along these lines, but failed to qualify. These objectionable conditions will never be removed and a better substituted until the people awake and establish the industrial high school, and grant the boy to choose his own line of studies in which case there will be a sequence of studies resulting in a rounded and satisfactory development of the youth.

We do not imagine, no, not for a minute, that anything we may say, shall have any influence whatsoever in reducing what we characterize as rooted prejudices. They die hard, if they die at all, and exist in fields where exist no sentiment.

The man outside with his eyes open observes the steam turbine quietly yet surely crowding the reciprocating engine, and his inquiries among the users of the former reveal surprising information regarding the economies of the apparatus giving it, the turbine many points of advantage over the reciprocating engine, but he turns to the engineer and he meets the belief, held by many of them, that the steam turbine requires an extravagant amount of steam and increases the coal bill to an extent that more than offsets the acknowledged economies in space, weight and labor.

A large central station in the East is developing, when using 175 pounds dry saturated steam at the throttle, of 11.47 pounds of steam per horse-power hour. Compare this with the reciprocating engine, which was 12.25 pounds per horse power per hour.

ACCIDENTS, DAMAGES AND LOSSES.

The Sunday Creek Coal Co. has filed a suit for \$15,724 against the Logan (O.) Brick Mfg. Company.

George S. Pettingil, the brick maker at Lewiston, Maine, broke his legs while at work in a piece of timber land.

John Wicks, Sr., has applied for a receiver for the Ford China Company, Ford City, Pa., alleging mismanagement, dishonesty and illegal use of bonds.

John Devinski, an employe of John Kline & Co., Wickliffe, O., was fatally injured by a delayed blast that was being made in some shale rock.

Frank Jonick of Little Ferry, N. J., driver for J. & W. Felter, brick manufacturers, was thrown from his wagon and fell on his head and hurt so that he died a few hours later.

In the suit of Hugh J. Phillips against the Jackson-Phillips Brick Co., Alexandria, Va., judgment was rendered in favor of the plaintiff, and the sheriff will sell 800,000 brick that had been attached by him.

By an explosion of a gas tank at the Conklin-Armstrong Terra Cotta Co.'s works, Philadelphia, Pa., Peter McDermott, an employe, was seriously burned, so that he had to be taken to the hospital.

Frank Smith, a potter, of Wellsville, O., was found dead with his head partly submerged in the Ohio river. He had drawn his pay and was last seen at a saloon a block away.

A. H. Mitchell, aged 56 years, had both of his legs crushed off in a cog wheel of a machine in the plant of the Queen City Brick and Tile Co., at Cumberland, Md., on March 24.

The La Clede Fire Brick Co., St. Louis, Mo., is suing the city for \$90,000 damages on account of the city sewer overflowing the plant, and asking for an injunction restraining the city from continuing the sewer.

The Colonial Trust Co., Pittsburg, Pa., entered suit against the American Clay Manufacturing Co., of that city, asking permission to sell the plant to recover money due. This is a clay manufacturing plant organized in 1896.

FIRE! FIRE!! FIRE!!!

The plant of the Globe Stoneware Co., Crooksville, O., was destroyed by fire causing a loss of \$40,000.

Fire started in the fire brick manufactory of G. H. Gunter Co., in Jersey City, N. J., and destroyed the plant, causing a loss of \$100,000.

The office buildings of the Farr Brick Company, near Forest City Park, Cleveland, Ohio, and the drying kiln were destroyed by fire, causing a loss of several hundred dollars and the records, which were very valuable.

Fire started from one of the decorating kilns of the William Brunt Pottery, Third and Walnut Streets, East Liverpool, O., and caused a loss of \$10,000. The effective work of the sprinkler system and the prompt arrival of the fire department saved the pottery, with a comparative small loss.

OBITUARY.

Otto Dietrich of the firm Dietrich Bros., brick manufacturers, at Dubuque, Ia., died at his home on Lincoln Avenue March 19. He was 38 years old.

Frank Cism, a partner of George W. Washburn, in the brick business, died at his home in Chelsea, Dutchess County, N. Y.

August Kuehn, who for 50 years lived in East Thirty-second Street, Cleveland, O., died March 24. During the greater part of his life he was engaged in the manufacture of brick. He retired several years ago, and was 77 years of age.

Martin N. Kimball, age 51 years, died at his home, 1459 Kimball Avenue, Chicago, March 25. For years he was actively connected with the Chicago Hydraulic Press Brick Company.

Herbert Bloor, for many years a resident of East Liverpool, O., died in San Francisco, Cal. He was a son of a pioneer pottery manufacturer in Ohio. He was the founder of the Dresden Pottery.

Theodore S. C. Balsley, born in Pittsburg 75 years ago, died at his home, 400 Howard Street, Detroit, Mich., March 23. In 1853 he established the Detroit Flower Pot Company, and was actively engaged in it until the break in his health came.

**RETIRING OWNERS OF BRAZIL CLAY PLANT
REWARD EFFICIENT SERVICE.**

D. E. Reagan, of Terre Haute; J. V. Ayer and W. L. McCarel, of Brazil, the retiring owners of the Ayer-McCarel clay plant which was sold to the Hydraulic Press Brick company presented the heads of the various departments of the plant each with a \$100 bill for efficient and faithful services. The recipients of these substantial favors were Harley Ireland, bookkeeper; Charles Hutchinson, superintendent; Joseph McMains, head burner, and Jobe Batten, mine boss.

**PETITION ASKS FOR BRICK SCHOOL
BUILDINGS.**

The brick manufacturing companies of Los Angeles, Cal., have petitioned the City Board of Education to use brick when constructing the new school buildings that are soon to be erected, instead of making them frame structures. The request was formally presented yesterday, being signed by the Los Angeles Brick Company, the Simons Brick Company, the K. and K. Brick Company, the Berg and Oxby Brick Company and the Southern California Brick Company. The petition states in part:

"Brick is strictly a home product. Every dollar expended for it remains in the city. The depreciation of a brick building is less than 1 per cent a year, while that of wood is approximately 4 per cent. Brick construction gives the city practically a fireproof building, greatly eliminating the danger of combustible frame, practically eliminates the painting bill and gives you insurance at about one-half the cost."

HYDRAULIC PRESS BRICK COMPANY BUYS AYER-McCAREL PLANT.

The Hydraulic Press Brick Company of St. Louis has purchased and taken charge of the Ayer-McCarel Clay Company of Brazil, Ind., of which Daniel E. Reagan of Terre Haute is president. The company manufactures impervious vitrified face brick and also glazed brick, the plant being one of the finest in the country.

The capacity of the Brazil plant, which is now 9,000,000 brick a year, will be increased by the Hydraulic Company to 20,000,000 brick a year.

There is but one other company manufacturing this style of brick and it is located in Kittanning, Pa.

It is understood that the company has not selected a manager for the Brazil plant, but will do so within the next few days. The present working force will be kept intact and Harley Ireland, who was assistant to Mr. Reagan, will continue acting as assistant secretary-treasurer.

The brick manufactured by the Brazil plant, which was established three years ago, is made from fire clay, which is mined from beneath coal. The growth of the plant has been rapid since its establishment and makes sales in all parts of the country. The consideration of the sale is not made public, but Mr. Reagan said that it was satisfactory.

The officers of the Hydraulic Press Brick Company are: E. C. Sterling, president; H. W. Eliot, first vice president and secretary treasurer; F. G. Middlekauff, second vice president and general manager; G. F. Baker, assistant treasurer; F. H. Dukes, assistant secretary.

The concern controls the following companies: American Hydraulic Press Brick Company, St. Louis, Mo.; Chicago Hydraulic Press Brick Company, Chicago, Ill.; Cleveland Hydraulic Press Brick Company, Cleveland, O.; Eastern Hydraulic Press Brick Company, Philadelphia, Pa.; Findlay Hydraulic Press Brick Company, Findlay and Toledo, O.; Illinois Hydraulic Press Brick Company, St. Louis, Mo.; Kansas City Hydraulic Press Brick Company, Kansas City, Mo., and Chanute, Kas.; Kelley Brick and Tile Company, West Superior, Wis.; Menominee Hydraulic Press Brick Company, Minneapolis, Minn.; New York Hydraulic Press Brick Company, Rochester, N. Y.; Ohio Press Brick Company, Zanesville, O.; Omaha Hydraulic Press Brick Company, Omaha, Neb.; Union Press Brick Works, St. Louis, Mo.; Washington Hydraulic Press Brick Company, Washington, D. C.

ATTORNEYS FOR BRICK COMPANIES PROVED DEFECT IN ACCUSATION.

The indictments against the members of the alleged Akron, O., brick trust have been quashed by Judge Hayden. The attorneys for the brick companies held in their motion that the statutes provide that in returning an indictment under the Valentine law it must charge the specific date upon which the alleged violation took place, and that in the indictments here only a continuous violation of the act was alleged.

Judge Hayden placed the men under bond for their appearance at the next term of the court in order that if the indictments are corrected the defendants may be held.

REFRACTORY CONCRETE FOR LINING KILNS, ETC.

The material which E. R. Stowell, New Corydon, Ind., calls refractory concrete, is a high refractory composition on which he was recently allowed a United States patent. He calls it "refractory concrete" because it can be worked the same as cement—i. e.: it can be wet and poured to a form, or moistened and tamped or pressed into desirable shapes; and will endure any degree of heat that fireclay products will.

Chemically, the composition is a compound of carbon and incompletely reduced silica (two high refractories) and a small portion of Portland Cement. The carbon and silica is reduced in the electric furnace at a temperature in excess of 6,000 degrees C. It is not possible to secure a degree of heat through the combustion of coal, coke, oil or gas, that will fuse the material.

Brick of a high refractory nature can be formed from the composition on any cement brick machine. With his process brick or any product of the composition can be cured and put into use in twenty-four hours.

Refractory concrete can be used in combination with any aggregate employed in concrete or cement construction.

For clay workers the material is particularly valuable as a kiln lining, or to be applied to the inside of kilns in the form of a plaster to the thickness of one-half or one inch. It will protect the walls, reduce the radiation, increases the heating capacity, for insulating steam pipes the composition is equal to asbestos or magnesia felt, and the cost per foot to insulate 3 inch pipe to the thickness of 1 inch will be less than 4 cents.

WILL BUILD SEVERAL BRICK PLANTS.

March 30 the stockholders of the Columbus and Hocking Coal and Iron Company will meet to vote on an increase of the capital stock of the corporation from \$7,000,000 to \$7,500,000, the increase to be in preferred stock. The company also proposes to issue \$1,000,000 of six per cent 50-year collateral trust bonds, these to be secured by the capital stock of a subsidiary company to be formed for the purpose of developing the clay fields owned by the company.

A syndicate has agreed to underwrite for \$400,000, less 2½ per cent commission, \$400,000 of the bonds and \$200,000 of the stock. But this amount of stock and bonds will be issued at once. A requirement of the underwriting is that the stockholders of the company be given priority of purchase at their option of the whole or any part of the new securities pro rata at the price at which they are subscribed for by the underwriters. This means that for \$1,000 a stockholder may get \$1,000 of the bonds and \$500 of the preferred stock.

The reason for increasing the capital stock and issuing the bonds is that the company proposes to build three brick plants in the Hocking Valley. It is estimated that the earnings of these plants will be in the neighborhood of half a million yearly and gives promise that the common stock of the company may be placed on a permanent dividend basis.

BATLEY OFF FOR THE PHILLIPINES.

Mr. A. R. Batley, who has been manager of the Beaumont (Texas) Brick Company since October last, at which time he succeeded Mr. Komiskey, has resigned his position and will be succeeded in a few days by Mr. S. E. Humphrey, who will come from Ferris, Texas.

Mr. Batley resigns his position with the brick company to accept a position with an American syndicate of New York City which has acquired large concessions from the Philippine government for manufacturing brick of all grades, of sewer pipe, conduits, fireproof goods and clay goods in the Philippines. The company in question is one of the largest in the world, having 47 different plants in the United States and plants in Mexico and other foreign countries. The government has been a large customer of the syndicate in the past and there are Philippine contracts outstanding with the government which will have to be filled. Mr. Batley says that the concern has acquired big landed concessions and that it proposes to erect a big plant in the Philippines.

Mr. Batley has left for Pittsburg, Kas., where he will join his family and proceed to the Philippines.

PICK STRIKES DYNAMITE.

John Derinski, employed by John Kline & Co., brick manufacturers of Wickliffe, O., was perhaps fatally injured by a delayed blast. The blasting was being done in some rock shale. All the men had been in places of safety when the charge exploded, but unknown to the workmen a part of the dynamite failed to go off. Derinski started to break the pieces loosened by the explosion with his pick. His tool struck the unexploded dynamite, which let go with terrible effect. It threw him many feet away and tore a hole in his chest and lungs which will probably cause his death. The injured man was taken in Shepard's ambulance to St. Vincent's Hospital.

NEW MARKET FOR BRICK MAKING MACHINERY NOW.

A new market for brick-making machinery has developed in South Australia, where there has just been discovered what appears to be a limitless quantity of a certain grade of clay particularly adapted to brick making. The discovery has been made at Kangaroo Island; four distinct varieties of clay have been found, suitable not only for the manufacture of fire bricks but also for high-class china and earthenware.

Millions of brick have hitherto been imported into South Australia, but it seems that the makers of brick machinery are now to have their innings, while the brick makers who have been supplying the South Australian brick market will have to look for new worlds to conquer.

France will suffer through the new discovery from the loss of her trade in roofing and flooring tiles, which can be made from the newly discovered clays. The pottery industry, which is thus expected to spring into being in South Australia, will be greatly assisted by the tariff, which imposes a 20 per cent duty on imported pottery.

SAND LIME BRICK PLANT PARTLY DEMOLISHED.

The brick manufactory owned by the Messrs. Joseph Decarie, Sons & Co., on the canal bank at Cote St. Paul, Quebec, was partially demolished by the explosion of a steel dry kiln.

The explosion blew out the head of the drying cylinder, and the latter was blown twenty-five feet into the yard, bringing part of the building down with it.

The steam boiler is still intact and in perfect order, which was confirmed by Mr. Edouard Champagne, the boiler inspector of St. Henri.

Mr. Champagne explained to a "Witness" representative that the only explanation he could give of the accident was that the man in charge of the drying cylinder may have allowed the steam to enter it a little faster than was necessary.

Messrs. Decarie at once started removing the debris, and they are hopeful of proceeding with brick-making again within the course of ten days. They estimate the damage at \$5,000.

Considering the damage to the building it is regarded as remarkable that the man and boy in charge were only slightly scalded.

M. MITSHKUM CO.'S CATALOGUE "A."

The above named firm are the manufacturers of Frogs, Switches, Crossings, Portable Track, Industrial Turntables, etc., at Detroit, Mich., and have just issued their catalogue "A." It contains 50 pages well filled with reading matter and illustrations upon the subjects referred to above.

When you are in need of anything in this line you might do well by letting this well known firm figure on your wants. Address the, M. Mitshkum Company, Detroit, Mich., and mention THE CLAY RECORD.

GLARE FROM BURNING FACTORY IN JERSEY CITY SEEN FOR MILES AS IT DESTROYS PLANT.

Fire started in the fire brick factory of the J. H. Guntier Company in Jersey City, N. J., destroyed the plant and furnished the most spectacular blaze on the Hudson river from there since the burning of the Hamburg American piers several years ago.

Flames appeared first in a shed adjoining the building, at Greene and Essex streets. The building was 175 feet front and 200 feet deep, and four stories high. It cost \$100,000 when completed two years ago. The flames enveloped the entire building in a few minutes.

There were five kilns for making fire-brick in the building, and each one was spouting heavy columns of flame and smoke when the firemen arrived. The blaze was seen for miles and a large crowd quickly gathered. The fire fighters were unable to save the main building and confined their efforts to adjoining property, which included the American Sugar Refining Company's plant.

When the roof fell in at midnight it caused the third and second floors to collapse. The fire was under control at one o'clock. The loss is estimated at \$200,000. The insurance was not reported.

SAND OR LIME BRICK OR BLOCK NEWS.

Charles Kummeraw and associates are organizing a company to manufacture sand lime brick at Norfolk, Va.

Miller & Kennard, Tampa, Fla., want to correspond with manufacturers of sand lime brick machinery.

The Superior (Neb.) Hydraulic Cement, Brick, Stone and Tile Co. has been incorporated with \$5,000 capital stock, by F. B. Felt, F. B. Dysart and C. W. Dysart.

J. Lawson, a mason contractor at Aberdeen, S. D., has invented a machine for making cement brick and will place same on the market.

A new firm has been organized at Pensacola, Fla., to manufacture cement brick. It is comprised of J. S. Mandeville and Charles H. Bliss.

The Standard Brick Machinery Co., 114 Liberty Street, New York, has been incorporated with \$50,000 capital stock by J. A. Wilbur, St. John Clarke and J. Bailey.

The Jay Brick Co. has been organized by J. L. Jay and O. L. Jay at Tipton, Ga., and will construct to handle the entire output of the Hansen Sand Lime Brick Company.

The Valdosta (Ga.) Stone and Brick Co. has been incorporated with \$10,000 capital stock, to manufacture brick and artificial stone. Incorporators are, A. F. Langford and C. E. Davis.

W. L. Temple will be the manager of the Hiawatha (Kansas) Sand Brick Works, to be located on Eighth and Iowa Streets. The brick will be made of three parts sand and one part calcined gypsum.

The Indianapolis Composite Brick Co., Indianapolis, Ind., has found a site at Belmont Avenue and Big Eagle Creek. Lawrence Elkus, the manager, reported that the plant will be built as soon as the frost is out of the ground.

The Sand Lime Brick Co., Live Oak, Fla., has been organized with \$25,000 capital stock. T. S. Brisden is president, B. W. Halvinstein vice president, and A. L. Humphreys secretary and treasurer.

William Eudaly of Grand Falls and James F. McKenzie of Pacos, Texas, will build a plant to manufacture cement brick from the white alkali soil. It is burned and treated to a process which renders it impervious.

The Rockaway (N. J.) Brick Co. has been incorporated with \$60,000 capital stock. They will manufacture sand pressed brick. Incorporators are, Emil M. Loewenthal and Joseph Tuttle of Rockaway and Thomas J. Hillery of Boonton, N. J.

The Iowa Enamel Brick and Stone Co., Des Moines, Ia., has organized. The plant will be in South Des Moines. The directors are, Frank Stehm, Orin Ruffcorn, I. E. Tone, H. S. Chase, W. H. Langen, D. M. Johnson and J. E. Howell.

The Cement Brick and Block Co., Battle Creek, Mich., has been organized with \$50,000 capital stock. The officers are, Edward Austin, President; H. F. Jacobs, vice president; L. E. Stewart, secretary and treasurer. They have taken over the plant of the American Stone and Construction Co.

MISCELLANEOUS ITEMS.

McClusky, N. Dak., is planning to have a brick works.

Stief Bros., proprietors of the Carey (O.) Tile & Brick Works, will double the capacity of the plant.

Pugsley & Duffield have established a brickyard near Sumner, Mich.

The Zumbrota (Minn.) Clay Mfg. Co. filed articles of incorporation with \$100,000 capital stock.

M. S. Randleman is going to put in a \$5,000 brick plant at Carlisle, Ia., providing the interurban comes there.

Thos. Cleary of Guilford, Ill., has purchased a stiff mud machine and will make brick.

The Crowl Brick & Tile Co., Cherryvale, Kansas, has asked for a charter with \$50,000 capital stock.

Wm. L. Hall of Madisonville, Ky., is installing a dry press brick machine in his plant.

W. H. Clauser & Son, Delphi, Ind., will establish a brick-making plant in that city.

The Mills Bros. Brick Works at Braddock, Pa., have been sold to Joseph Wolf, a hotel keeper, for \$50,000.

The J. T. Davie Brick Co., Mead, Wash., has been incorporated with \$30,000 capital stock by J. T. Davie, Peter Erickson and John A. Hurd.

Thos. L. Sherer has sold his interest in the West End Brick Co., Allentown, Pa., to his partners, Robert J. and Richard Frederick.

The Interstate Clay Products Co., Owensboro, Ky., will build a plant near Hot Springs, Ark. Wm. F. Keates is president.

B. B. Liddil has contracted to burn a kiln of brick at Stevensville, Mont. If satisfactory the industry will be continued.

William H. Dennis has leased the Curtis brick yard on Windsor avenue, Hartford, Conn., from Nevels Bros. for three years and will form a company to operate it.

Lewis Johnson has disposed of his interest in the Willmar, Minn., Brick Co. to N. N. Flykt, the manager, who now owns five-twelfths of it.

M. J. McGinty of Minerva, Ohio, acting for Cleveland capitalists, has leased the mineral rights on the Joe Bros. farm and it is their intention to erect a modern brick plant.

The Aetna Brick Co., Brooklyn, N. Y., has been incorporated with \$120,000. The directors are J. H. Goldberg, 554 48th street; Adolph Weiss and Simon Abels, all of Brooklyn.

The Northwest Front & Ornamental Brick Co., Spokane, Wash., has been incorporated with \$30,000 capital stock by J. B. Schrock, William Hunter, S. G. Copeland, F. H. Hilliker, G. L. Rolfe, Paul Shallenberger and W. J. Walker.

Chas. L. Flanders has succeeded Chas. W. Sugden as manager and director of the Sterling Brick Co., Marietta, Ohio. A number of improvements will be made to the plant.

John Gaffney of St. Louis, Mo., has made arrangements to move his plant to Ft. Smith, Ark. Forty acres of land has been bought five miles from the city on the Missouri Pacific railway.

T. O. York will make brick at Nampa, Idaho, this year for the new sugar factory.

The price of brick at Northampton, Mass., is now \$12 per thousand and the supply small.

Andrew J. Bryan, 708 Hennen Bldg., New Orleans, La., is in the market for press brick machinery.

Lorenzo Davis of Montgomery, Ala., is investigating the establishing of a brick plant at Gulfport, Miss.

The Richlands (Va.) Brick Co. has increased its capital stock to \$50,000 and will spend \$10,000 for improvements.

The Taylor-Thomas Brick Co., Crystal Springs, Miss., has been incorporated by W. B. Taylor, J. J. Thomas and others.

Wm. Protheroe has sold his interest in the Eldora (Ia.) Tile Works to S. B. Gardner and hereafter the proprietors will be Meader & Gardner.

The work of rebuilding the plant of the Pfaltzgraff Stoneware Co. at York, Pa., has been started. A new site in West York was secured.

Agency, Iowa, is to have a brick and tile works. Alex Giltner, John Enyart, N. O. Johnson and W. Clements are the directors of the company.

I. Goldberg, Highland Park, Ill., has sold his yard and 20 acres of ground to the Northwestern Terra Cotta Co. of Chicago, who will erect a large factory on it.

The Y. O. C. Brick Co., Pine Bluff, Ark., has been incorporated with \$25,000 capital stock. The officers are: Geo. B. Yauch, pres.; J. W. O'Neill, vice-pres.; M. L. Case, secy. and treas.

Dr. W. F. Shaw and J. O. Nelson, Colorado Springs, representing Illinois and Colorado capitalists, have bought extensive clay deposits in El Paso county, Colo., and will build a large plant.

The Maryland Brick & Supply Co., Frederick, Md., has been incorporated with \$50,000 capital stock by Geo. W. Smith, D. E. Kafauver, H. L. Gaver, G. H. Staley and C. E. Schildknecht.

Roger Moore's Sons & Co., Wilmington, N. C., have secured a new location on Smith's creek and will put up a new brick-making plant costing \$18,000. The capacity will be a million a month.

The Appian Brick Co., Buffalo, N. Y., has been incorporated with \$100,000 capital stock by Joseph H. Diehl, Ernest F. Snyder, Chas. B. Stone, Cleveland G. Babcock and Charles Humphreys.

The St. Elmo Tile & Brick Co., St. Elmo Station, Chattanooga, Tenn., has been incorporated with \$60,000 capital stock by A. W. Poe, H. W. Brown, W. E. Poe, W. E. Reynolds and Emil Wassman.

The New Jersey Company has been incorporated in Jersey City, N. J., with \$1,500,000 to make brick, tile, etc. Incorporators are Alwyn Ball, Jr., Royal C. Peabody, Elmer J. Stouffer and Walter E. Hope.

At the annual meeting of the Metropolitan Paving Brick Co., Canton, Ohio, C. W. Keplinger was elected president, W. E. Keplinger and Col. J. J. Sullivan, vice-presidents, and H. S. Renkert, secretary and treasurer.

J. A. Gardner, Orleans, Neb., will put in a brick making plant.

H. G. Pool is arranging to operate a brick plant at the new town of Wendell, N. C.

yard on Lincoln avenue, Dubuque, Ia. The Mueggenberg yard also has been sold to John Heine.

Gust Hess, of Monroeville, Ohio, has gone to Pierre, S. Dak., where he will put in a plant to manufacture dry pressed brick.

The name of the Ohio Brick Co. at Ripley, O., has been changed to the Ripley Brick Co., and the capital stock increased to \$25,000.

Voelker & Groff Brick Co., Winona, Minn., made 3,000,000 brick last year, and will increase the capacity of the plant by making some improvements.

Clark & Pickard, Minonk, Ill., have sold for \$14,000 their brick and tile plant to E. Goodwin & Sons.

Chris. A. Voelker has bought the Deitrich Bros. brick The motors for the New Hampshire Brick Company, Plaistow, N. H., are being put into place to furnish power to manufacture brick by electricity instead of steam power.

The Urbana Brick Co., Urbana, O., has been incorporated with \$10,000 capital stock by Patrick Heatherman, John O'Brien, John Heatherman, Christy McCluskey and J. B. Brennan.

J. J. Miller has purchased the interest of Seeley McCord in the Benton Harbor (Mich.) Brick and Tile Works, and is now the sole owner. Improvements are contemplated by Mr. Miller.

Articles of incorporation of the Smith Brick Co., Omaha, Neb., have been filed, with \$100,000 capital stock. J. Fred Smith, Ida V. Smith and George B. Dyball are the incorporators.

The Zachary (La.) Brick Yard Co. has been organized with \$15,000 capital stock. Albert Strenzke is president, L. B. Loudon, vice-president, and W. H. Fields, secretary and treasurer.

Dr. Hasbrouck of Garnerville, N. Y., associated with Daniel Farley, Wm. Hurley and Wm. Oldfield of West Haverstraw, will build a brick yard at the latter place that will run winter and summer. The capital stock of the company will be \$25,000. The company will be the West Haverstraw Brick Co.

NOW READY

A TREATISE ON

PRODUCER-GAS and GAS-PRODUCERS

BY AN ACKNOWLEDGED AUTHORITY.

A 300-page book containing thirty chapters, giving the fundamental principles and definitions, calculations, classifications, manufacture and use; the fuel, the requirements, the history, its by-products, **Producer-Gas for firing kilns, steam boilers, and power plants.** The future of the Gas-producer and a bibliography.

OVER 100 CHOICE ILLUSTRATIONS—PRICE, \$4.00.

A subscription to the CLAY RECORD for one year without additional charge to those that are not now subscribers.

CLAY RECORD PUBLISHING COMPANY

CHICAGO, ILL.

Morgan E. Turner has sold his brick yard at Port Ewen, N. Y., to A. S. Staples of Kingston.

The Delton (Mich.) Brick and Tile Company has leased its plant for the year to Whittemore Bros.

Arthur P. Wyand, formerly of Piedmont, W. Va., has been made manager of the Frederick (Md.) Brick Works.

William Parry and his son Alden of North Cambridge, Mass., are soon to start in the brick business at Gonic, N. H.

Powell & Minnock are rushing work on their new brick plant at Coeymans, N. Y., so as to have it ready when the season starts.

The Alex. A. Scott Brick Co., Knoxville, Tenn., recently booked an order for 10,000,000 brick, securing same against sharp competition.

C. R. Littel of Littel and J. Elbert Williams have leased the Centralia (Wash.) Brick Works, and will improve it so as to supply the demand.

C. Green, Denison, Ia., has taken in his son as a partner in the brick business, and the firm name hereafter will be C. Green & Son. They will improve the plant.

The Excelsior Clay Co., Brazil, Ind., has been incorporated with \$50,000 capital stock, by George Brandenburg, Marie Brandenburg and Will H. Seiders, John C. Kidd and J. V. McGregor.

The Piedmont Brick Co., Lowell, N. C., has been incorporated with \$100,000 capital stock. The incorporators are: A. D. McLennon of Charlotte and S. M. Robinson and J. M. Wilson of Lowell.

Parsons, Kansas, men have again the control of the Nelson Brick Works at Mound Valley, Kansas; J. C. Appich is president and H. F. Reid, H. W. Raber and E. L. Green are the directors, all from Parsons.

The Calhoun (Ga.) Brick Co., J. H. Legg & Son, proprietors, have sold their plant to Atlanta parties for \$41,000 and will build a new, modern yard, with modern machinery for turning out fire brick.

Do you know of any one who is meeting with greater success in putting in kilns than Thomas M. Wilson of the Wilson Kiln and Dryer Co., 503 Market Street, Pittsburg, Pa.? See ad on page 46 and write to him.

The Saugerties (N. Y.) Brick Co., has been incorporated with \$100,000 capital stock. Incorporators: William H. Parr and J. Fred Cryer, The Bronx; William J. Merritt, Joseph Lane and Edward E. Hargrave, all of New York.

The Winchester (Ind.) Tile Co. has been organized with \$10,000 capital. J. M. Carver is president, B. F. Wilmore secretary, and J. C. Meier treasurer. They have bought the Kelley-Sanders Brick plant, north of town, and will put in new machinery at once.

A meeting of the stockholders of the recently organized Hollywood Brick Co., York, Pa., was held, and John Landis was elected president, S. F. Gladfelter vice president, F. M. Bortner secretary and James W. Kilgore treasurer. Work will be started at once on kilns and buildings.

The Washburn (Wis.) Brick Co. has been incorporated with \$10,000 capital stock by E. E. Kenfield, W. A. Sprague and others. C. C. Frampton will manage the plant.

The Scott Kiln-Drying Co., 1596 North High Street, Columbus, O., is asking you a few vital questions on page 3 of this issue. Read it.

R. W. Doolittle and R. L. Rube, Newton, Miss., have purchased 160 acres of clay land and will establish a first-class brick factory, making 60,000 brick daily.

S. J. Galvin, formerly secretary of the Des Moines Brick and Tile Co. has bought the brick plant at Iowa Falls, and has organized the Galvin Brick and Tile Co. to operate same. New machinery will be installed at once.

The Dry Press Brick Yards Co., of Spokane, Wash., is building a \$30,000 brick plant at Sandpoint, Idaho. The officers of the company are, P. F. Clinton, president; George H. Williams, secretary and treasurer; and H. J. Williams, manager.

If you are considering changing your power plant, it might be well for you to write to the New Era Gas Engine Co., Dayton, O. They have had considerable experience in equipping brick plants with gas engines. On page 47 is an illustration of their engine.

The City Brick Co., St. Paul, Minn., has leased the Corey Pressed Brick Co.'s plant at Lehigh, Ia., for a term of five years. The new company will add new kilns, place in other brick presses and equip the plant to four times its present capacity.

Refractory Cement

(So called because it is worked the same as cement)

A high refractory composition that can be used the same as cement, cured and put to use in twelve to twenty-four hours, and will endure any degree of heat that fire-clay products will.

Applied to the inside of a kiln it will protect the walls and give increased refractivity; will reduce the cost of repair, and save fuel in any kiln.

Every boiler furnace should be lined inside with "Refractory Concrete." It will protect the walls and increase the heating capacity by preventing radiation.

For insulating steam pipes this composition is guaranteed equal to asbestos or magnesia felt; the cost per foot to cover a 3-inch to the thickness of 1 inch will be 4c.

Refractory brick of a high order can be formed from the composition on any cement brick machine.

For flue linings, chimney blocks and tops, floor and partition blocks, conduits for electric wires, etc., this is the ideal material.

Refractory Concrete can be combined with any aggregate used in the formation of cement products.

For information pertaining to your particular requirement, and prices, address.

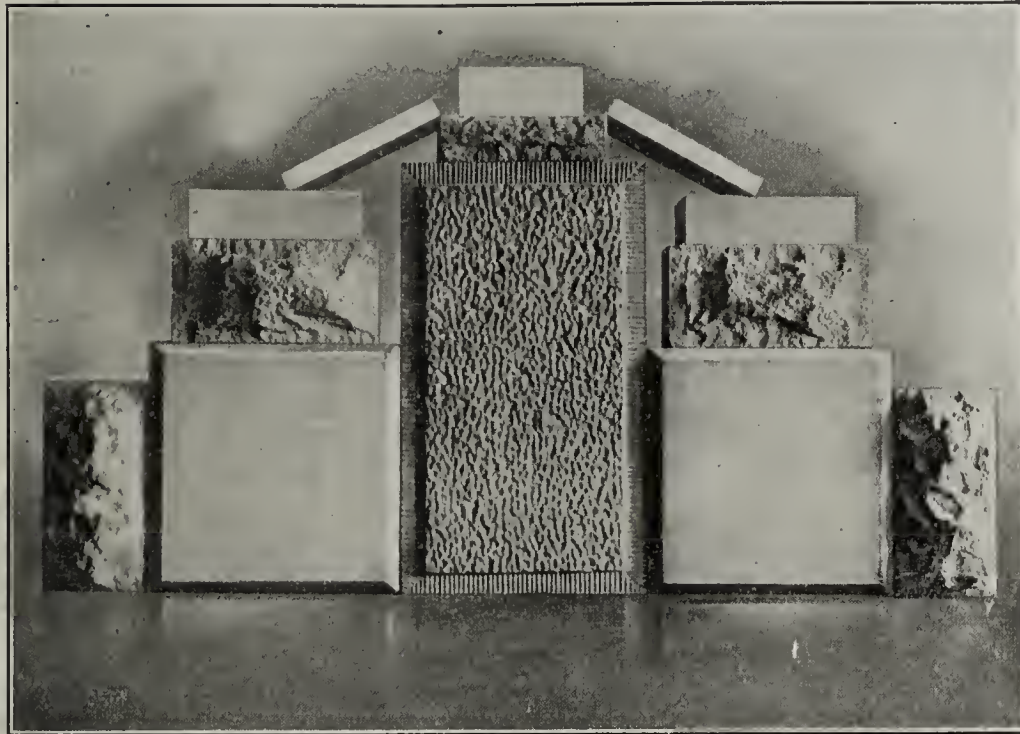
E. R. STOWELL
NEW CORYDON, INDIANA

FRANCIS H. CRANDALL,
President.

JOHN A. WILBUR,
Secretary and Treasurer.

COLBY M. AVERY,
Engineer.

Sand-Lime Bricks and Blocks



Huennekes System

30 Factories in Operation

WRITE FOR CATALOGUE

Sole Owners of Huennekes System Patents

STANDARD BRICK MACHINERY CO.

Engineers and Contractors for Sand-Lime Brick Plants

114 Liberty Street,

NEW YORK CITY

CLAY RECORD.

CLAY LAND FOR SALE.

74 acres. Samples, pavers and sewer pipe, made from this clay, shows in all official tests equal to the standard pavers. Bed located on railroad and Erie canal, seven miles from Syracuse, N. Y. This city is to spend over a million dollars in sewerage. Property is sold on guarantee to make a No. 1 paver and sewer pipe. Terms easy.

HENRY LOFTIE,
216 Burnett Ave., Syracuse, N. Y.

FOR SALE.

An interest in my tile and brick plant, to one of experience, that can take charge and run it. Must be able to invest some money in plant. Plenty of good clay at back door, and good market at front door. This is an opportunity that you don't often run up against. Plant now running. Come and see or write

S. H. RECORD,
Charleston, Ill.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

Profitable running brick plant, 25,000 capacity. Ready sale for entire product. Owner has larger interests requiring attention.

TERRA HAUTE PRESSED BRICK CO.
Terra Haute, Ind.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address
T, care Clay Record,
Chicago, Ill.

BRICK YARD FOR SALE IN GAS BELT.

A fine brick yard for sale. Dry Press. Everything new last year. Five up-draft kilns. Making money. Fine shale bank. Can make brick cheaper than any yard in Kansas. Reason for selling one of the partners has large oil interests in Indian Territory. Will give time on part of price. Making 30,000 brick daily and ready sale. Address

A. B., care Clay Record,
Chicago, Ill.

FOR SALE.

A brick and tile factory, located in Washington Co., Iowa, in a prosperous condition. Would consider an Illinois or Iowa farm.

E. L. TEAL,
Anderson, Ind.

FOR SALE.

A second-hand Four-Mold Dry Press. Has not been used more than a year. Good condition of repair guaranteed. Also good second-hand 44-inch Pulverizer. Address

BOSTON,
Care Clay Record, Chicago, Ill.

POSITION WANTED.

Wanted, position as foreman or manager of a Dry Press Brick Plant of not less than 20,000 brick per day. A number of years experience. Address

ELLIS,
Care Clay Record, Chicago, Ill.

FOR SALE.

Chambers End Cut Brick Machine, capacity 3,500 brick daily. 75 double deck roller bearing stiff mud brick cars.

STEELTON & HARRISBURG BRICK CO.
Steelton, Pa.

PARTNER WANTED.

A good, reliable man of experience, with some capital to invest in and take charge of a new Dry Press Brick Plant. Plenty of shale, and good market for all the brick. Address

DENIS, care Clay Record,
Chicago, Ill.

Machinery For Sale.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.

Both styles of cars in first-class repair.
ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second hand No. 2 Giant Auger Brick Machine. "GIANT,"
Address
Care Clay Record, Chicago

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.

THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets.
10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new.
DEALER,
Care Clay Record, Chicago, Ill.

FOR SALE.

A Two-Mold Boyd Dry Press, in excellent condition, having been used but very little. Will sell cheap. Address

G. PAULL ALEXANDER,
Canton, Ohio.

FOR SALE.

One 70 horse power Frost Tubular Boiler, one 45 horse power Frost Slide Valve Engine. In good condition, will sell cheap as we have changed to electric power.

CENTERVILLE BRICK & CONSTRUCTION CO.
Centerville, Iowa

WANTED.

An experienced and competent brickmaker to take charge of soft mud plant near Cincinnati. State experience, references and wages expected.

GENERAL SUPPLY & CONSTRUCTION CO.
24 State St., New York.

BRICK PLANT FOR SALE.

Splendid Chance for Contractor.

One of the finest, most modern brick plants for sale in southern part of Central Illinois. Live growing city, good prices, making money. Dry press, built in 1904. Best of reasons for selling. Price \$25,000, if taken at once. Address

ILLINOIS, care Clay Record.

FOR SALE.

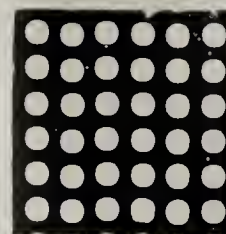
A brick and tile plant, equipped with up-to-date machinery, 60,000 daily capacity, down draft kilns, inexhaustible bed of best clay suitable for all kinds of building, facing and paving brick, drain, tile, sewer pipe, etc., on two railroads, demand very good. Address

B, care of Clay Record.

FOR SALE

A Shale Brick Plant; capacity forty to sixty thousand per day. Six kilns, two 80-horse power boilers and 150-horse power engine. Fifteen acres of land with abundance of shale, makes good paving and building brick. Located on branch of B. and O. Ry. Ready sale for entire output. Address

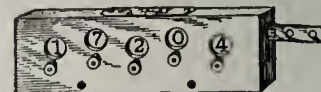
ROSS W. FUNCK, Trustee,
Wooster, Ohio.



PERFORATED METALS

for all purposes
Prompt shipment of all
orders guaranteed.

H. S. SIMPSON,
817 Chamber of Commerce
Chicago, Ill.



No better made, cut from
\$3 and \$10. to

4 Wheel, \$3.00
5 Wheel, \$3.25

Guaranteed.

Sold by all dealers

Super Juggers quoted.

K. A. HART, 41 White St., BATTLE CREEK, MICH

FOR SALE.

Up-to-date brick plant with Creager machinery, in prosperous city of 15,000 inhabitants, in Southern Illinois. Good residence and farm of 40 acres attached to plant. Splendid opportunity. Only plant in city. Address

H. H., care Clay Record, Chicago.

MACHINERY FOR SALE.

One 4-mold Simpson Dry Press. One Steadman Pulverizer. All size boilers and engines from 30 h.p. up. Send for list.

MERTES MACHINERY CO.
Milwaukee, Wis.

FOR SALE CHEAP.

First-class brick and tile plant. Good machinery, unlimited clay supply, 25,000 capacity daily, 3 kilns 170,000 capacity, dry sheds, etc. Track connections. A snap if taken at once. Address

H. C. MODLIN, Secretary,
Perry, Iowa.

ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

FIRE CLAY LANDS.

500 acres underlain with heavy vein superior fire clay and light vein coal, which can be mined cheaply, on the line of the N. Y. C. & H. R. R. R., in Pennsylvania, for lease on royalty at low price per ton. For further information address the owner.

BOX No. 308, Williamsport, Pa.

FOR SALE OR EXCHANGE.

One of the best small brick and tile plants in Southern Michigan. 20,000 capacity, Stewart patent kilns, good drying sheds, all machinery in first-class condition, fine clay, good market. Will sell at a bargain or will exchange for good real estate.

Address,
MICHIGAN,
Care Clay Record, Chicago

STEAM SHOVEL FOR SALE.

Barnhart style "B," good condition, large enough to dig clay for 100,000 brick in 8 hours. Apply to

ILLINOIS BRICK COMPANY,
918 Chamber of Commerce,
Chicago.

FOR SALE

One Fate & Co. Brick and Tile Machine. "D" size
One Fate & Co. Automatic Tile Cut-Off Table.
One Fate & Co. Side-Cut Lubricating Die.
One Fate & Co. Brick Cut-Off Table, pallet delivery.

Fire Kiln Bands for 22-foot kiln.

J. C. LANTZ & SON,
Mansfield, Ohio.



Vol. XXVIII. No. 7.

CHICAGO, APRIL 16, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

REPORT OF THE SIXTH ANNUAL MEETING OF THE WISCONSIN CLAYWORKERS' ASSOCIATION.

THIRD SESSION

President Wilson: I believe it is in order to announce the committee to recommend a place for meeting next year and also the nominating committee for the officers for the coming year. I have appointed for this Committee, Mr. Ringle, Mr. Gunther and Mr. Meier.

Mr. Weidman: I would like to announce that as a resident of Madison, Madison will extend an invitation to the Clay Workers' Association to meet at that place next year. As you know, we have a great many things of interest there. In extending this invitation, I would like to have the Committee understand that they will have to set aside their general rule of selecting a President who lives in the town at which they decide the next meeting shall be. I would also call attention to the fact that the Legislature meets in Madison next Winter.

The first number on the program is the subject of "The Test of Wisconsin Bricks," by Prof. Ries of Cornell University, which Mr. Weidman will read.

THE TESTS OF WISCONSIN BRICK

In my paper presented to the Wisconsin Brick Manufacturers' Association last year I stated that a number of tests were being made on the bricks from the different factories in Wisconsin and expressed the hope of being able to present in more detail the results of these tests at the next meeting. Since then these tests have been completed and have been productive of a number of exceedingly interesting results.

In order to test the qualities of the bricks made in Wisconsin, a number of samples were collected from different localities, ninety-one in all. Ten bricks were collected from each locality, normally burned ones being selected as far as possible, either from the kiln or the stock pile. In a few instances under-burned or hard-burned bricks were taken in addition to the normally burned ones.

The samples thus selected were shipped to the University of Wisconsin at Madison, and tested in the Engineering Laboratory by Messrs. C. V. Hopper and L. F. Van Hagen.

Each set of bricks was tested for (1) its crushing strength; (2) its transverse strength, and (3) its absorption. In every case five bricks were crushed in order to give a reliable average, and the results are given in detail in the accompanying charts.

EXPLANATION OF TESTS

Crushing test: This test was made for the purpose of determining the number of pounds pressure per square inch that the brick

will stand without crushing. The strength will naturally vary with the density of the brick, degree of hardness to which it has been burned, character of the raw material, and amount of care taken in the manufacture.

Few bricks show a crushing strength of less than 2000 lbs. per square inch, while some even exceed 15,000 lbs. per square inch, but none of the Wisconsin bricks reached the higher limit and few fell below the lower one. As a matter of fact, however, bricks when set in a wall are seldom compelled to stand the weight they are capable of resisting.

The test to determine a brick's crushing strength is commonly made in a specially constructed machine. Half bricks are usually tested, because a whole brick has so large a surface area that it sometimes resist a greater load than the machine is capable of supplying. Before crushing the two opposite surfaces of the brick (in this case the top and bottom) must either be ground perfectly smooth and parallel, or else they must be built up to this condition by the application of a layer of plaster of paris. The reason for this is that in the testing machine the brick is set between two steel surfaces, unless its surface fits perfectly against these, the pressure will not be evenly distributed.

Before crushing, the area of the brick's surface is measured, and, the total load necessary to crush the brick, divided by this area, gives the crushing strength in pounds per square inch.

Transverse Strength: This is more important than even the crushing strength, for while a brick is rarely loaded to its crushing limit, it is sometimes exposed to its limit of elasticity and cracked.

In the cross breaking test a whole brick was placed on two rounded knife-edge bearings six inches apart. Pressure was then applied by a third edge from above, until the brick broke in two and the number of pounds pressure at which this occurred noted. It is evident that in two bricks of exactly the same degree of strength the amount of pressure necessary to break them will depend upon the distance between the supports and the cross section of the brick. The farther apart the supports the less pressure necessary. Since this is so, it is necessary that for purposes of comparison all results of the breaking strength shall be reduced to some uniform expression, which shall take account of the differences of length, width and thickness of the brick. The most accurate expression is that termed the *modulus of rupture*, which is calculated from the following formula:

$$R = \frac{3 W l}{2 b h^2}$$

in which R=Modulus of Rupture.

W=Pressure necessary to break the brick.

l=Distance between the supporting knife edges,

b=Breadth of the brick.

h=Thickness of the brick.

This means, that three times the pressure in pounds multiplied by the distance between the supports, is divided by twice the breadth of the brick multiplied by the square of the thickness. If the pressure necessary to break a brick was 1,500 lbs., distance between the supports six inches, width of brick four inches and thickness two inches, the modulus of rupture would be calculated as follows:

$$\frac{3 \times 1500 \times 6}{2 \times 4 \times 22} = 834.7 \text{ pounds.}$$

Absorption test: An absorption test is made for determining how much water a brick is capable of absorbing. This indicates approximately the degree of porosity which it possesses. Vitrified brick are impervious or nearly so, will absorb little or no water, while many common bricks will absorb 15 or 20 per cent and some of the Wisconsin ones absorbed over 30 per cent. It is easily understood that if a brick of high porosity is exposed to a freezing temperature when its pores are filled with water, the expansion of the latter, when changing to ice, may be sufficient to disrupt the brick, either after one freezing, or after repeated freezings following periods of thawing. A moderate or low temperature is therefore desirable.

The absorption test is usually made by carefully drying the brick, then weighing and soaking them for 48 hours in water, and weighing again, the increase in weight showing the amount of water absorbed. The percentage of absorption is calculated in terms of the original in dry weight.

Objections have been urged by some to this method of determining the absorptive power of a brick, it being claimed that the pores of a brick do not become completely filled with water, and that a better way is to place the brick in a vacuum while it is immersed. In making absorption tests we should not forget that we are trying to duplicate as nearly as possible the conditions to which the brick will be exposed when in actual use. Under such conditions a brick is not exposed to vacuum but absorbs moisture while exposed to ordinary atmospheric pressure, and consequently by the vacuum method we are forcing the brick to absorb much more water than it would when in use, and are obtaining results of comparatively little practical value.

The writer does not feel either that the total immersion of the brick is the best way of testing its absorption, but that partial immersion will yield the most satisfactory results. With this last mentioned method the brick is immersed to perhaps two-thirds its depth in water, which allows the liquid to be drawn into the pores by capillarity while the air in the interspaces of the brick can readily escape.

In testing the Wisconsin bricks the absorption by all three methods was tried. Two half bricks were tested for absorption by complete immersion in water for 48 hours. Two other half bricks from the same lot were immersed to half their depth in water. At the end of four hours these were taken out and the gain in weight noted. These two samples were put back into the water and allowed to remain 44 hours longer, their absorption being again determined. It was found that in nearly every case, the bricks at the end of four hours had absorbed over 90 per cent of the total quantity they were capable of absorbing. The method of manufacture and degree of density of the brick did not appear to affect the result in any way whatever.

A third pair of half bricks were completely immersed in water under a vacuum, so that all the air could be extracted from the pores and the brick become completely saturated. By this means a greatly increased absorption was obtained. The per cent gain over the absorption obtained by the first method ranged from about 6 to 60 per cent.

In the accompanying charts the details of the crushing, transverse and absorption tests are given.

DISCUSSION OF TESTS OF BRICK

Crushing strength: The crushing strength of Wisconsin brick tested ranged from 993 lbs. per square inch up to 7060 lbs. per square inch. These tests were made upon 91 sets of brick.

The range of strength in the several classes is as follows:

Kind	Minimum	Maximum	Average
Soft mud	1074	5838	2829
Stiff mud	1304	7060	4244
Dry press	993	5558	3408

This indicates that the average crushing strength of all the stiff mud and the dry press bricks made in Wisconsin is higher than the average of the soft mud bricks. Anyone not acquainted with the character of the clays used might perhaps ascribe this to the process rather than the material.

The true explanation seems to the writer to be this. Most of the stiff mud brick manufactured in Wisconsin are made from cream-burning clays. These in most cases have to be fired much harder to get a good brick than do the red-burning ones. Consequently the manufacturers of cream brick fire their product as hard as possible, while the red brick manufacturers knowing that their clays fire easily, do not take the trouble to fire them hard.

Transverse strength: The transverse strength of all kinds of Wisconsin clay brick tested ranged from 157 lbs. to 1027 lbs. Classified by kinds the range was as follows:

Kind	Minimum	Maximum	Average
Soft mud	157	1438	573
Stiff mud	1438	1861	1027
Dry press	575	702	512

Here the order is found to be a little different than in the case of crushing strength, the stiff mud brick showing the highest average, followed by the soft mud and these by the dry press brick. The same order also applies to the maxima and the minima.

Absorption: The percentage of absorption in the different bricks tested ranged from 5.8 per cent to 34.30 per cent. Classified by kinds it was as follows:

Kind	Minimum	Maximum	Average
Soft mud	5.80	28.20	18.60
Stiff mud	27.60	34.30	20.26
Dry press	12.90	33.35	21.47

Here the order is again different. The soft mud brick showing the maximum absorption as well as the lowest average absorption, while the stiff mud showed the maximum and highest average absorption. That of the stiff mud and dry press bricks is so high because they are made from calcareous clays.

CONCLUSIONS DEDUCTIBLE FROM THE DIFFERENT TESTS

1. The stiff mud brick show the highest crushing strength because of the character of the material to which this method of manufacture is usually applied in Wisconsin.

The minimum strength shown by the stiff mud series falls considerably below the maximum crushing strength of either the soft mud or dry press brick tested.

2. There is no direct relation between the crushing and transverse strength, a brick with a high crushing strength showing sometimes either a low or high transverse strength or vice versa. The following figures illustrate this:

Lab. No.	Kind	Average crushing strength	Average Modulus of Rupture.
220	Soft mud	1192	526
114	Soft mud	4572	559
22	Soft mud	3036	1063
137	Soft mud	5796	1062
99	Stiff mud	1540	588
128	Stiff mud	2708	550

There are instances to be sure in which two bricks of nearly equal crushing strength will show closely similar transverse strengths. Thus

216	Stiff mud	6230	964
202	Stiff mud	6250	946

Two series of bricks showing different crushing strengths may either show the same transverse strengths, or the one of higher

crushing resistance may also show higher transverse strength. Thus

207	Stiff mud	2234	1097
158	Stiff mud	4996	1090
99	Stiff mud	1540	588
205A	Stiff mud	5110	2190
138	Soft mud	1192	526
114	Soft mud	4572	569

3. The percentage of absorption is not necessarily an indication of the strength of the brick either crushing or transverse. This is well brought out by the following examples selected from the table of tests:

Lab. No.	Kind	Crushing Strength	Modulus of Rupture	Percentage absorption
216	Stiff mud	6230	964	19.6
205A	Stiff mud	5110	2190	7.6
99	Stiff mud	1540	588	34.30
	Dry press	2704	431	18.75
114	Soft mud	4572	569	14.40
137	Soft mud	5796	1062	22.25
138	Soft mud	2398	589	24.65

4. Harder burning will increase both the crushing and transverse strength thus:

206S	Dry press	993.3	256
206H	Dry press	1996.6	469.6
28	Stiff mud	1500	464.2
28A	Stiff mud	4852.5	1311.5

5. An interesting comparison is afforded by Nos. 143 and 90.

			Percentage absorption
143	Stiff mud	4596	749
90	Dry press	2704	431.8

Here we have two bricks made from practically the same clay, but moulded by different methods. If the dry press brick were harder burned it would no doubt show up better.

Another example can be selected from a second locality at which cream-burning clays are used.

206H	Dry press	1996.6	469.6	33.35
80	Stiff mud	3380	1034	20.55
202	Stiff mud	6250	946.4	16.6
203	Stiff mud	3452	893.4	16.3

6. The transverse strength is often, and in fact almost invariably affected by the presence of pebbles, lumps of clay, or cavities, and whenever one of a series tested shows a low transverse break it can in nearly every instance be traced to this cause.

7. The crushing strength is less easily affected by the flaws mentioned above.

Member: How do you account for the variation in the absorption?

Mr. Weidman: I think that is largely due to the kind of clay used—whether cross-grained, and the way it is burned as Prof. Ries has explained. These are actual tests made on the bricks: I do not know anything about the facts or their explanation any more than as they are explained in the paper just read.

Member: Now, in that dry press table that you give us there were two samples and the last one, the strongest, has the lesser absorption. Now, according to your paper, if hard burned it would be stronger and absorb less?

Mr. Weidman: That brick may not have been burned hard—as hard as it should have been to reduce the absorption.

Mr. Joannis: It evidently showed a greater crushing strength.

Mr. Weidman: Yes.

Member: But without knowing the clays you cannot form a table.

Mr. Weidman: I did not do the work, but I think they are principally facts as to the results of the tests and facts brought out which show these variations. The variations, I should think, are more due to the character of the burning than the character of the clay used.

Member: Would the presence of stone in the clay make any difference in the absorption?

Mr. Weidman: If there was very much lime stone, it would not make any sort of brick at all: it would crack in burning.

President Wilson: The gentlemen of the convention may be interested to know that Mr. Weidman reports that the report of Prof. Ries that has been being prepared for some time is at last in the hands of the State Printer and there are some hopes of getting it out in printed form before very much longer. You will agree with me that we have been anxiously waiting for it in such form as it is expected it would be, but Mr. Weidman states that the State has a great deal of work on hand in the way of printing just at the present time.

Mr. Weidman: It seems to me that practical brick makers ought to be able to discuss this table. I should like to see the dry press brick man discuss it. The modern brick man ought to be able to answer questions as applied to their brick.

President Wilson: I am inclined to think, Mr. Weidman, when the report comes out, if it shows the name of the company, the yard and the location—that each individual will discuss the part he is interested in at any rate. They will begin then to realize and figure how to improve upon their own bricks; but on a proposition of this kind I am inclined to think most of them will think they are discussing their neighbor's brick instead of their own. There is certainly great food for thought in the figures presented.

Mr. Crabtree: I would like to ask Mr. Weidman if it is not likely, in order to have an absolutely sure test, that all of these different tests should have been made from one kind of clay—soft mud, stiff mud and dry press—to all the relative difference between the different processes. Perhaps one kind of clay would have a great deal more strength in crushing, transverse or absorption than another and when different tests are made on different kinds of clay, if they could get at a very fair comparison at that rate? I think some of you practical brick men can answer that question.

Mr. Weidman: Of course these facts enter into the problem and it was not the object of the tests to make an actual comparison in that way—only to show that there was a variation in the brick and that the variation was due to the fact of the kind of clay, as well as the method of manufacture.

Mr. Joannis: One clay would not absorb so much.

President Wilson: What I was getting at was that I do not think the comparison is of very much utility where you do not know the clay that you have.

Mr. Bailey: I want to know why this test was made. The more floor space the brick has the more water it will absorb and an expansion will be brought about when the water freezes in these pores and every time it freezes the water expands and after a sufficient number of freezings a brick will tend to crumble. Now, in a brick that has a low absorption there will be small expansion because there will be less water in them and the brick with a high absorption will contain more water and when they freeze they will fall, crumble and break down when exposed to freezing and thawing. I understand that is the general theory, but from practical experience after a long term of years, it has been proven to me that it is not always the porous brick that will stand the most loss. We have a living example of it here in this city. It is only an imperfectly burnt brick that will show the most absorption. This is a very important test and I do not go a great deal on tests. Some clays will stand a great deal more than others.

Mr. Kennedy: This has brought on a discussion that I was not looking for, but in picking a brick for facing a wall, I would pick a hard burnt for the reason that they won't absorb so much water as the soft burnt brick and consequently won't shell off. If you take a soft burnt brick, it is all right on the inside where it is comparatively dry, but if you put them in a basement or in the wall just above the ground line and it will absorb so much water that in the spring and when the spring frosts are on, the brick will shell off, showing that the brick were soft and that they absorbed too

much water and the frost broke them. I think the reason one brick absorbs more water than another is on account of the burning. If the clay is properly mixed and is burned properly, it reaches that stage of hardness where it condenses and if allowed to burn long enough and hard enough it will become so hard and so compact that it will not hold scarcely any water.

President Wilson: That is the fact that Mr. Bailey wants to bring out, but Mr. Bailey might tell us how to burn a kiln of all hard brick.

Mr. Bailey: That is impossible.

Mr. Hamilton: You have not yet replied to Mr. Crabtree's inquiry as to tests. Mr. Crabtree asked Mr. Weidman as to the manner of making tests.

Mr. Weidman: It would not be practical for the State to take a sample of clay from any one bank and make a stiff-mud, and a soft-mud, and a dry-pressed brick out of it just to see which method would make the best brick; but the object, as I understand it, is to take each brick maker's sample and see what the result of his particular method of manufacture is. You cannot expect the State to go any further than that.

Mr. Crabtree: What I intended to say I believe in my ignorance I left out. If these tests be made from entirely different clays, would the results be entirely different.

Mr. Weidman: It is very probable that in the stiff mud brick the result would be different if the same clay was manufactured in different yards. These tests, of course, are the tests made on brick from that particular yard, and if the same clays were burned by someone else, they would show different results.

President Wilson: Mr. Crabtree may have possibly overlooked that fact that a great many clays would not work successfully in a dry press.

Mr. Crabtree: I supposed that these tests were made in each individual kind of clay. I suppose that is what the idea is—educational—to find out whether brick made in a certain manner would have a commercial value.

Mr. Weidman: Each of the tests is only for the brick that are tested.

Mr. Joannis: The way I understand it—this report is for the stiff mud men and the dry press men, and is for comparative purposes only.

President Wilson: The next number on the program is a paper on "The Benefits of Organization," by Mr. T. A. Randall, Indianapolis, Ind.

THE BENEFITS OF ORGANIZATION.

The subject upon which I am requested to speak is one of much interest, but is so general in character and covers such a wide range of human endeavor that the temptation is great to simply deal in glittering generalities which, while pleasing perhaps, is as a rule unprofitable. The benefits of organization are so numerous that to merely mention them is to catalogue the chief agencies of modern progress. We all know and realize in an indefinite way that modern progress is due to organized effort, but we are prone to credit this to other lines, rather than to the business with which we as individuals are identified. Personally we like to feel that our own work is paramount and that the balance of the world is indebted to us. As a matter of fact, our individual efforts count for little; so little in fact that, as we drop out of life's race from time to time, we are not even missed except by those near and dear to us. Nevertheless, individually, we fondly hug the illusion that we are important factors in the world's affairs.

In speaking of the benefits of organization, it may be said that the very foundation of American trade and commerce is organization. If you will look back upon the work of the present generation of business men, you will see that the principle of organization is so much a part of the woof and warp of every enterprise as to all but obscure other features which have been a part of the phenomenal development of trade. The old spirit of personal identity with the various details of manufacturing, the knowledge which a generation ago was thought to be essential on the part of the proprietor

has largely been supplanted by the brains of the organizer. This is illustrated by a story of Mr. George M. Pullman who, some years ago, was asked some question in regard to an important matter in the sleeping car business. He touched a button, a young man came into his sanctum, and by Mr. Pullman's direction gave the desired information. Noting the quizzical look on the inquirer's face, Mr. Pullman said, "That is a part of our work which I find it advisable to hire others to do for me. I hold on to only one string in my business, and that is organization."

A similar story is told of Marshall Field. One of the partners in his business retired from the firm unexpectedly. The same day Mr. Field selected another man from the ranks of his employees, put him in charge of one of the most important departments of his great store and, the following day, sailed for Europe. You see, Mr. Field held on to the same string—organization.

There are many aspects of this subject to be considered. Doubtless the most notable, as well as the most successful, business organization, is that of the Standard Oil Company. As the head of that great concern, John D. Rockefeller has achieved world-wide fame. He is the greatest alchemist the world has ever known, for he has turned a crude substance into a great stream of gold. But the source, as well as the channel, of this broad stream is not Rockefeller, but organization.

The perfection of the Standard Oil system is illustrated by the following story: Rockefeller is reported to have said to his son-in-law one day last December: "Well, boy, we have been making some changes and improving the organization, and we think we will make some money next year." The young man, who is connected with a cotton manufactory, said: "I don't doubt that, but you will not make any of it from our firm, for we never buy a dollar's worth of oil from the Standard Oil Company." "Where do you buy your illuminating oil?" he asked. "From such an such a company," he said. "Good, we own all the stock in that company," was the reply. "Where do you buy your lubricating oil?" "From such and such a company in Pennsylvania," he replied. "I am vice-president of that company," said Rockefeller. Now, that may or may not be a true story, but there is little doubt but that the situation which it illustrates obtains in the oil business. But it is not Rockefeller who has done all this, it is organization.

There is little likelihood of such an organization as the Standard Oil Company becoming operative in the clay world. But it affords an object lesson which clay workers may well study carefully, for organization applies not alone to great combinations, to great co-operative bodies, but as well to the success of local industries and general individual enterprises. We are all familiar with instances of foolish and wasteful competition. Brick makers are not alone guilty in this connection. All manufacturing lines of a local character are subject to the same criticism, but they are all learning that the key to large and permanent success is organization.

I presume, gentlemen, that when the secretary asked me to speak on this subject he really meant that I should speak of the benefits of association, and while the terms are well night synonymous, there is a difference. One of the most direct benefits of associations, such as this, is that it leads to and encourages organization among the members of the several districts throughout the State, and on this account it is to be regretted that the attendance of our State and National Conventions is not more general. Many of our clayworkers do not appreciate the benefits of these meetings or there would be many more Wisconsin Clay Workers here to-day.

To get an idea of the scope and magnitude of association work and its benefits we may assume by way of illustration that associations are to industrial life somewhat of the same nature and importance that our schools are to civic welfare. We may even extend this simile to comparing local associations to common public schools, State associations to normal high schools, and the National associations to colleges and universities. This comparison may seem a little odd at first, but the more you study association work the more intimately you become acquainted with it, the more natural this comparison may appear, for the great features of all our asso-

ciation work are educational. Not alone is this true in a broad and general way, but to a high degree in specific and technical lines. Because it is a part of our daily lives, being brought right into our homes by the progress of our children, we properly appreciate the importance of our school work. If it was brought closer to us, more of us would appreciate the value and importance of association work, for, as I have said, industrial associations are the same balance wheels to industrial life that public schools are to the education of the children. The great progress of the last generation in industrial affairs is due to the association of those connected with the various industries. American manufacturers have made wonderful growth during this time, the credit for which is generally given to Yankee inventiveness and American hustle and enterprise, and that is no doubt correct, but these influences find their best expression through our industrial associations.

Developments in the past decade have demonstrated clearly that associated effort is far more effective in all directions than individual effort; no matter how able or capable the individual may be. There is every reason to believe that industrial associations will wax stronger in the future and become still more influential in the development of all industries. Obstacles in the way of progress which might be insurmountable to the individual are easily overcome by organized effort. A notable example of this is afforded by a recent occurrence in the clay world. Your neighboring State, Illinois, now has at the University of Champaign a school for clay workers. The appropriation for its establishment and maintenance was obtained by and through the Illinois Clayworkers' Association. When the President of that Association and a committee appointed for that purpose, appealed to the Legislature as representatives of a State association, they were given an attentive hearing. Do any of you think that if they had gone there as individuals that they would have been listened to seriously for a moment? You who have had experience in legislative matters know that they would not.

I see by your program that the question of the regulation of railroad rates is now under consideration, and I am confident that if you go before the proper tribunals you will, as a State association, receive consideration that you cannot hope for individually. An instance of this same sort, but connected with an entirely different industry, came to my attention recently. In one of our metropolitan cities there are quite a number of merchants who handle fruits and vegetables. They are commission merchants, hundreds of them who deal in perishable produce. For years past they have had to pay excessive rates to the railroads, who justified same on the plea that they had to protect themselves from loss incident to the character of the goods shipped. Individual complaints were made time and again, but to no avail. Recently these commission merchants formed an association and a committee was appointed, and in less than two weeks' time a readjustment of the rates was obtained. Your committee can hardly hope for such quick action, but you will certainly accomplish more as an organization than you could hope to individually.

One of the greatest benefits derived from membership in an association results from the friendly relations established with those who are competing in the same field. Competition is the life of trade, but unfriendly competition spells disaster to all who indulge in it. Friendly competition does not necessarily mean an agreement to fix or advance prices, but it does not mean a rational comparing of notes and conditions, which oft times will thwart the foxy contractor who strives for a cut rate by misquoting one manufacturer to another. You who meet in these yearly gatherings touch elbows and become personal friends ought to be immune from that species of imposition, and there are many other ways in which the relations growing out of these annual conventions are profitable as well as pleasant.

Improvement in quality of product is another benefit derivable from membership in industrial associations. No thinking manufacturer can participate in these deliberations, and the button-hole talks in the lobbies without positive and direct benefit. These interchanges of personal experiences lead to improvements in methods

of manufacture which insures greater economy and a better product. Clayworkers who do not attend these gatherings may look over the proceedings and because they do not discover some new and remarkable suggestions for money-making may conclude that there is nothing for them to learn here. Others may read the report of the convention studiously and with profit, and think that they have realized the full benefit of the convention without the expense of attending. Both classes deceive themselves to their own loss. To many the convention papers and discussions are really of less value from a practical point of view to those who attend conventions than the confidential lobby talks, for through the latter means practical men get specific information upon minor details of their business which oft times are extremely important and valuable.

Then there is the social side, and who is there among us all who would undertake to measure in dollars and cents the value of the friendships formed and the delights of personal intercourse of these yearly gatherings? Do you know I have a supreme sympathy for the man who blindly ties himself to his daily work and, under mistaken thought that it demands his every moment, deprives himself of the joys and pleasures incident to occasions of this sort. It is a mistaken policy and those given to it need the leaven of the spirit of organization. I feel and believe that there is something wrong with a man's business methods if he cannot leave his business at times for a day or two at least. The man so tied becomes narrow and if his working days are not shortened his capacity for work is lessened by his narrow field of vision. Not the least of the advantages of association is the broader and stronger grasp that it gives of one's personal affairs and of the more comprehensive view of the general affairs of life.

Now, gentlemen, most of you will agree with me that life is not all in the acquisition of wealth. There is another side, the development of our better selves and these yearly meetings certainly tend to cultivation of that better side. If no other purpose was achieved, our conventions would not be in vain, but time well spent. (Applause.)

President Wilson: If there is no discussion, I will say that this concludes the papers on the program. We now have a few details, and the first on the list is the report from the Secretary.

Mr. Hamilton: I did not prepare a written report. It only consists of a statement of receipts and disbursements and that has been turned over to the Treasurer, Mr. Zimball, whose report includes my own.

President Wilson: If there are no objections we will accept this much of the report from the Secretary and hear from the Treasurer, which will include his financial transactions:

TREASURER'S REPORT.

Receipts.

Balance in treasury last year.....	\$79.64
Received from dues.....	10.00
Received from advertising.....	80.00
Received from Dues at Monomonic.....	67.00
Received from T. A. Randall & Co.....	8.00
Received from Harry de Joannis.....	8.00

\$252.64

Disbursements.

Paid for reporting Convention at Manitowoc....	\$16.00
Stamps	14.81
T. A. Randall & Co. (three hundred reports).....	48.00
Stationery	8.25
Express	2.54

Balance in Treasury 163.04 \$252.64

A member: I move that the report be received and adopted and placed on record. The motion was seconded and carried.

President Wilson: The next number on the program is the report of the Committee on the Lien Law. Has that report been submitted yet?

Secretary Hamilton: I have not yet received any report.

President Wilson: Mr. Kennedy, can you give us any light on the subject? The Committee was appointed two years ago and last year they were not ready and we gave them another year. Mr. George Schwarz was one.

A member: Mr. President, I have seen this lien law tackled. Is your lien law satisfactory?

Mr. Kennedy: Yes.

A member: Then, let well enough alone. If you have a fairly good lien law now you had better keep it, because if you go before the Legislature—unless you have an influential committee—let it alone. If your lien law is satisfactory, you had better leave it alone unless you have a good strong committee, and one which will work for the Association as a whole and concertedly.

Mr. Kennedy: That is the reason why they did not do anything: they could not agree on any one course of action to take.

Mr. Vogt: I know a little about the lien law. Last year I had some dealing with the Secretary of the Lumbermen's Association and asked him for his views and what was best to do and whether we could not associate ourselves with the lumbermen on this point and he said that we might lose what little we have and that they were afraid to tackle it and that we had better leave it alone.

President Wilson: We had better then leave that matter as it is for the present. Has Mr. Vogt anything to say on the next subject "Railroads?"

Mr. Vogt: I have nothing specific to offer on this point. Many complaints have been made against discrimination by the Railroads against shippers of brick in Wisconsin in favor of outside shippers into this State. In Milwaukee quite a number of complaints have been made but I could never find any specific claim on which we could base our action, and I have not heard of any brick maker who had such specific claim that he could substantiate. Of course, we can hire an attorney, but we must state some specific complaint—what that complaint consists of. I told Mr. Burnham before I left that I did not know of any basis for action against the railroad nor did I know of any other shippers in Wisconsin that could furnish them. Our firm does not ship brick to amount to anything; and, while we have been complaining that the railroad companies transport brick shipped to Milwaukee from Chicago on a discriminative basis, we have no specific case for action.

President Wilson: Mr. Kennedy opened up this subject yesterday pretty well and if he has anything else to offer, we would like to hear it.

Mr. Kennedy: Mr. President, I think you have in your possession now a paper on this subject, but which I do not care to have read at the present time because it may reach the wrong parties at the wrong time; but in that paper that I gave and put in your hands—in that paper I cite a specific case, giving the rate, the paid receipts, etc. How I got this evidence is no one's business, but I got it. I have been through the State just before this Convention—through the northern part of it—and while on this trip I made it a particular point to look into this matter. I have talked with brick men in that territory and find they have the same complaint to make. I have looked into this matter and I am well aware that you cannot come out in a crowd of men like we have here and state all that you want to state and that you want your attorney to prove; but I am confident that if we get some attorney that is not receiving a retaining fee from the railroad companies—that will go before the Rate Commission and who will start an investigation at once—I am confident that when this is done it will be up to the railroad companies to show their books. I think then the Rate Commission will look after this matter.

President Wilson: For the benefit of those that were not here yesterday, I wish to state that a resolution was passed authorizing the chair to appoint a committee of three to take this matter in hand and the committee was not to be named until to-day, as it was expected Mr. Burnham of Milwaukee would arrive in the meanwhile. Unless there are some objections the chair will announce the committee. The committee that has been appointed consist of Mr. Kennedy of Manitowoc, Mr. Burnham of Milwaukee and Mr.

Hamilton of Grand Rapids. One of the difficulties that this Committee is up against is the fact that it is a very difficult matter for them to do anything along the lines indicated without spending some money. If we are going to appoint a committee and expect them to accomplish anything, we have to provide them with the needful to engage the services of the party that it is necessary for them to have. What is the pleasure of the Convention?

Mr. Bright: I think it would be wise to make some provision that this committee would have power to draw on the Treasurer. They might have to make a trip to Madison and see the Commission, etc.

President Wilson: As some of the members have expressed themselves that it is necessary to employ legal advice, I think most of you that have had experience in employing legal advice will know that it costs money. We cannot expect this committee to do the work that is before them and accomplish anything without authority to use at least a certain amount of money for this purpose.

Mr. Kennedy: There is no money asked by the Committee except the pay for the attorney. I speak for Mr. Burnham as well, for I know him and for Mr. Hamilton. Last year we did some work and have gone to some expense, etc. I want it to be understood that if you allow anything that it is to be for expenses. It is to be only for the attorney; he must be paid, and it is not fair to ask us to guarantee the fees of the attorney.

President Wilson: In order to have a definite understanding before the Association, Mr. Kennedy, I would like to have you state what, in your opinion, would be a reasonable limit to place.

Mr. Kennedy: I could not tell you what the cost would be; I am just as much in the dark about that as you.

Mr. Hamilton: I notice our balance is now \$163.00 in the Treasury. Of course, that is a balance that we ought to keep. I think it would be a good idea to levy an assessment on the members—such as is necessary to cover the attorney's fees. I think we would have no trouble in collecting such an assessment.

Mr. Kennedy: I know of no particular reason why we should keep the money in the Treasury. I think you had better spend that money as soon as you get it. The expense of an attorney to draw up the proper papers is necessary and to go before the Commission would not be much—how much I do not know, but I should think they ought to give the committee the privilege of using their own judgment to not to exceed \$100.00. If it should come higher than that I for one would be willing to guarantee the cost of the attorney's fees and bring it before the convention next year, and I believe I will be supported in that.

President Wilson: What is the pleasure of the convention?

Mr. Vogt: I make a motion to the effect that the committee be authorized to draw on the Treasurer for the legal advice not to exceed \$100.00.

The motion was seconded and carried.

Mr. Lowater: Is the purpose of the committee to cover any particular case, or is it general in its character?

President Wilson: I understand that it is any railroad business that they may have occasion to look into relative to Wisconsin business. There is no certain item yet that we are after particularly.

We will now take up the next item on the program. I did not prepare a large question box for this occasion, but I think it will be understood that any questions that any of the members wish to ask can be handed to the Secretary or asked at this time in person. Has any member present any question along the lines of his work that he wishes discussed?

Mr. Bright: As I understand it—if any member has any grievance with the Chicago companies on rates that they take it up with the committee just appointed.

President Wilson: Yes, as the Wisconsin Clay Workers' Association, gives them more pressure.

Mr. Randall: Is there any particular railroad that is guilty of giving rebates, or are all the railroads equally guilty. If not, if you can find one of the lines that will take your business, you could make arrangements with them and then the other railroads will soon come into line.

Mr. Kennedy: But, most of us are on only one line. You have to do just as they tell you—just as they do with the long distance telephone: "If you don't like it you can lump it."

Mr. Ringle: I understand that in the present situation we propose to see what effect our Railroad Rate Commission—what authority they have in regulating these rates—and place our complaints in their hands and ask them to make a good rate for all of us and Chicago shippers as well as ourselves. We want them to regulate the rates and to make no discrimination. There are only two railroads in the State running out of Chicago, the C., M. & St. P. and the North Western, and it is impossible to try the remedy suggested by Randall.

Mr. Stell: As Mr. Ringle has said, there are only two railroads running out of Chicago which touch any of the brick yards there. The Burlington has no brick factories on their line and I do not think the Wisconsin Central has any. It is not as though you had a whole lot of railroads. The plan that Randall suggests, therefore, seems to be impracticable.

Mr. Crabtree: I do not know very much about the rates, but I do know a little something about the rate commission and the power they have. Judging and going by a decision of the Supreme Court of other States, especially in the Northern States, the commission has the authority conferred upon them by the Act authorizing them to reduce rates, make rates on complaint of any shipper or any citizen of the State or anyone to reduce a rate to any point not below where it would yield a reasonable compensation for the services performed on the part of the railroad company. and where they have no authority for through rates, they can in a manner equalize the rate to the State line, and I think that if this committee goes before the rate commission, and lays this matter before it properly, it will succeed.

Mr. Chapman: I think that Mr. Hinkley has stated the case about right and that is that this present committee can do nothing but preliminary work. I think, though, that Mr. Crabtree is mistaken if he intended to state that the Wisconsin Rate Commission can in any way control the rates from Chicago to Wisconsin. They cannot change that through rate nor can they stop the rebate. If the Chicago companies get rebates they cannot help that. If this committee has to do with questions that involve rebates on through rates from outside points of the State, it is a question that will have to be brought before the Interstate Commerce Commission and Therefore, I think that this is preliminary work. I do not think that these questions, if they affect a certain community only or a certain territory only, should properly be taken up by the Association and that the dealers in that locality should stand the expense—the dealers who are actually interested. I think the association proper should be used only in advancing questions that are of interest to all of us. Questions of this kind would be of no interest to me and probably not to many of us with yards in this part of the State, except to investigate and see what the trouble is.

Mr. Crabtree: I was in Madison last winter at the time this question was before the committee and the sense of the meeting at that time was that it should have the authority as I explain before. I think if you will look up the records, you will find that this is so.

Mr. Chapman: The Constitution is so constructed that the State cannot interfere with anything outside the limits of the State. They have nothing to do with shipments that originate in Illinois and are on Illinois bills of lading.

Mr. Russell: I am not a member of the Association; I am simply a visitor, but I have your interests certainly at heart, and as an outsider, I can look at the matter with perhaps somewhat different glasses than the others. It has been my privilege in the past few years to be in a more or less degree interested in the manufacture of vehicles and implements and I attended their national meeting three years ago, and I was very much interested in the work they were doing as a national organization with the railroad companies. The report of their committee on railroads at that meeting was most flattering after they had realized that they had saved their members a great many thousands of dollars in the matter

of rates. This organization is one of the best national organizations that I know anything about, and the members of these State organizations and the officers of them would get a great deal of valuable information and a great many points of interest from the officers of that organization. One thing that I remember—they had a national attorney that was employed by that organization who was willing to give advice free of charge to any of the members of that organization, and at this time I would like to ask Mr. Randall if the National organization of clay workers has a paid attorney.

Mr. Randall: The National Brick Manufacturers have never had any legal proposition before them at all. The national organization is educational only.

Mr. Russell: The remarks that I have to make are simply as a suggestion, and it seems to me that if this committee that you have appointed this afternoon would correspond with the officers of the national organization that I have spoken of, they would perhaps get some information that would do them untold good. Mr. Staver of the Staver Buggy Company, Chicago, is a very active member of this association and can give you the names of all the officers and is just the person to go to; and if this committee would confer with them they would find these men very gentlemenly and hospitable people to talk with and who would be only too willing to give them the benefits of their labors with the railroads in the investigations that they have been up against in the railroad proposition.

Mr. Hinkley: I just wish to remark in a few words that the most of us who are interested and have gone into this matter firmly believe that these shippers from Chicago ship their brick into this country at 8 or 10 cents per cwt., but that they actually get a rebate. I do not know if we have any means of proving that, but I think that this committee can investigate that matter and if they do find that they get a rebate, they can take some action. The railroads have to publish their rates and adhere to them. The committee might investigate this and get some reliable information on the subject.

Mr. Kennedy: That is why the committee needs legal advice—to get the law reduced to writing. Don't think for a moment that you are going to fight two railroads and get a reduction in the rate. One hundred dollars goes to the attorney to draw up his papers and bring the matter before the Rate Commission and then we are in the hopes that the Commission will take it up: what they can do we do not know.

President Wilson: I think the members fully realize that this is merely a step toward preliminary work that will bear fruit for those that are most interested. If there is nothing further at this time, we will hear the report of the Committee on Resolutions.

Secretary Hamilton: *Resolved*, That the Wisconsin Clayworkers' Association assembled at Monomonic, Wis., March 10th, 1906, express to Mr. P. H. G. Durrwaechter, its deep sense of corporate loss caused by the death of Arthur Durrwaechter, one of its promising members. Let it be further

Resolved, That the Secretary of the Wisconsin Clayworkers' Association be instructed to send a copy of this resolution to Mr. R. H. C. Durrwaechter. (Signed.) Sam. Gunther, S. Weidman, Harry de Joannis.

President Wilson: We will now hear from the Committee appointed for the purpose of looking into the matter of raising the dues of this Association and the matter of the distribution of the reports.

Mr. Hinkley: The Committee have had the matter under consideration and, while we tried to look at the matter in all its aspects and bearings and with particular care, came to the conclusion that with the ordinary work that we do here and the ordinary expense that we are under for the publication of our reports and that there having been a gain each year in the Treasury and that we have more money now in the Treasury than for our ordinary expenses, we have come to the conclusion that unless we have some extraordinary expenses to incur we do not care to raise the fees. If we go into litigation with the railroads, that will be different. We thought it best to wait for that until next year until this Committee on Railroads find out what we have to do. As to publish-

ing reports, as far as we have been able to talk with the members they are all desirous of having the reports printed, and it seems as long as the advertising pays for the printing of the report, we ought to send them to every member of the association and to every manufacturer in the State so far as known. That is the judgment of the committee.

President Wilson: It is not so much the expense of getting out the report as the fact that some manufacturers and brick men who are not members of this association get hold of the report, read it, and say to themselves, "What is the use of joining the association so long as we can read the reports?" It is more for the purpose of increasing our membership by having them sent to the members of this association only.

Mr. Hinkley: The committee looked at it in this way—that by circulating the reports it will bring us new members. In sending these out we let people know that we are organized and it will bring us new members.

President Wilson: We will now hear from the committee appointed to name a place for the next meeting and the names of the officers for the coming year

Mr. Ringle: The committee has considered the matter and begs to report as follows:—To the Wisconsin Clayworkers' Association: Your committee recommends that the place and time for holding the next annual meeting of the Association be subject to the decision of the newly elected officers of the Association. Your committee respectfully recommend the following gentlemen as officers of the Association for the ensuing year:

* President, Oscar Wilson, Menomonie.

Vice-President, S. J. Gunther, Port Washington.

Secretary, J. G. Hamilton, Grand Rapids.

Treasurer, Oscar Zimball, Sheboygan.

Your committee is unanimous on this report, except as to Vice-President from which recommendation Mr. Gunther dissents. (Signed.) John Ringle, Sam. J. Gunther and W. L. Meier.

Motion made, seconded and carried that the officers selected be elected.

Mr. Lowater: Was there anything settled as to the place for next meeting and convention?

President Wilson: The report of the committee specifies that the place and exact time be left with the newly elected officers. The sentiment of the convention is in order on this subject.

Mr. Weidman: I think if the sentiment of the convention is known at this time it would be for the officers to decide.

Mr. Joannis: I move that we adjourn.

After the motion for adjournment was seconded, it was placed to the vote and carried.

ADJOURNED.

EIGHTY-SEVENTH BIRTHDAY OF EDWARD BROUSSEAU.

Edward Brousseau, the veteran brick manufacturer, celebrated his eighty-seventh birthday March 17 at his home in Schodack-on-the-Hudson, N. Y., with the usual gathering of his family and relatives. A turkey dinner was served. The table decorations were green and white and the souvenirs were green boxes in the form of harps and contained green bonbons. A large heart-shaped birthday cake, decorated with green candles forming the number 87, was served. The candles were lighted and Mr. Brousseau blew them out one by one. He made a wish as he cut the cake. He received many gifts. Among the guests were Mr. and Mrs. Byron Parker, Mr. and Mrs. Theodore Brousseau and S. W. Brousseau of Hudson; Mrs. Marinda Briggs of Athens, Mrs. Peter R. Bedell of Coxackle and Mr. and Mrs. Frank Anderson of Castleton.

A PLEASANT VISIT TO A NEW SAND-LIME BRICK PLANT.

Just twenty weeks after ground had been broken the Sandstone Brick Co., of Schenectady, N. Y., was making its daily output of good commercial sand-lime brick. While in Schenectady some time ago I had the pleasure of visiting this plant and seeing it in operation. It has been my good fortune to see quite a number of sand-lime brick plants, but I never have seen one so complete in every detail. Everything is of the best and the general excellence of the bricks is a demonstration in favor of this policy of the company. The brick machinery was all furnished by the Semisteel Co., of Cleveland, O., and consists of two Samson presses, dryer, conveyors, mixers, cylinders and cars. The material, consisting of sand and hydrated lime is first measured off into a pan mixer. From here it falls by gravity into a pug mill. After traveling through this mill it is elevated to another pug mill mixer, which stands on a platform. Here the water is added and incorporated with this mixture. In these two mills the mixing is very thorough, and the mixture emerges free from lumps and in proper condition to be formed into bricks. By means of a very ingenious conveyor both presses are kept supplied. The presses are the well-known rotary type and are strong, massive machines capable of exerting a tremendous pressure.



Erecting Smoke Stack, Schenectady, N. Y.

A word about these machines in passing would hardly be out of place. The mixture of sand and lime is received by the press in a mixing pan, which, besides giving the material an additional mixing, also feeds the press and fills the moulds automatically. The table in which the bricks are made is circular and revolves around a center post. The power for the presses is transmitted by means of a crank shaft connected to a massive slow moving rocker beam. As the bricks are made one at a time, all this enormous pressure is received by each and every brick. Inasmuch as the quality of a brick depends more upon the amount of pressure it receives than upon the quality of the sand of which it is made, one can readily see that a

superior brick is the natural result. Another advantage that this press possesses is its capability of maintaining its maximum pressure for a relatively long period of time. This is accomplished by means of an extremely simple means whereby the pressure is brought to its maximum before the crank shaft arrives at dead center. During the travel of the crank from this point to a point at the same distance the other side of center this same pressure is sustained. This is a decided advantage. Of course, in common with all other rotary presses, it delivers the brick to the top of the table without any of the shocks incident to the pushing and shoving that other types of presses impose upon the bricks. From here they are handled directly to the cars, which hold a thousand bricks. The bricks are so hard as they



Unloading Cylinder at Schenectady, N. Y.

come from the machine that they will bear the weight of a man without breaking. In fact, I saw the engineer stand on one and then jump up 6 inches or so in the air and come down on the brick with his full weight without damaging it in the least. After doing this several times, he picked the brick up and put it back on the car. The next morning it came out as strong and perfect as the rest of the bricks. The engine was made by the Allis-Chalmers Company of Milwaukee, Wis., and is giving the best of satisfaction. A little marine set furnishes the electricity for the electric lights, and the motors used on the portable sand conveyors. With the aid of the electric lights it is possible to run the factory twenty hours a day in two shifts of ten hours each. The water is obtained from a driven well over three hundred feet deep. Two reservoirs store enough water to run the boilers several days. The sand bank is directly back of the plant, and it requires very little work to transport the sand to the mixer.

During the greater portion of the year it is not necessary to use the dryer at all, but during the wet spells a small part of the sand is dried. The finished product is in good demand and the company has large orders ahead that will keep it busy for several months without taking any other business.

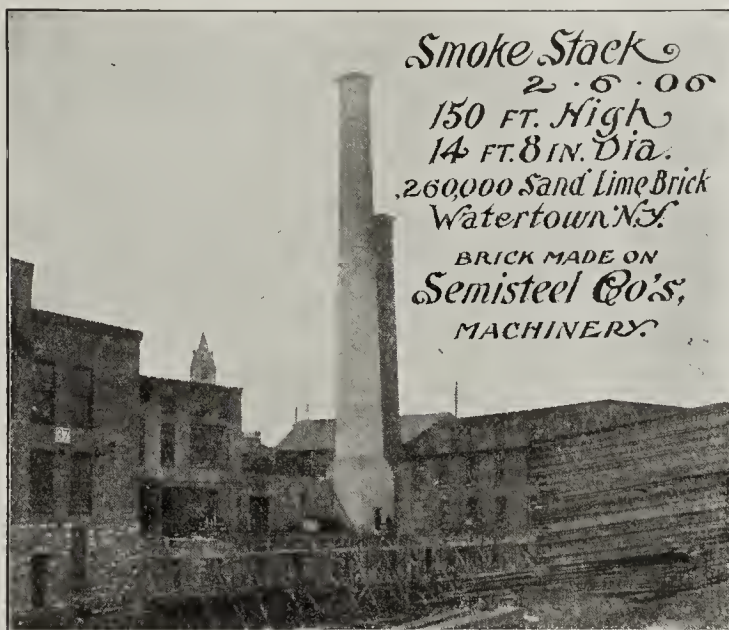
The officers of the company are so pleased with the

proposition and the way the bricks are selling that they have ordered two more presses from the Semisteel Company. This will give them a daily capacity of 72,000 bricks.

One of the points that arrested my attention was the lack of dust and dirt. Upon inquiry I learned that this was due to the fact that the lime was not hydrated or ground in the plant, but was bought already hydrated. Mr. Kastenhuber, the genial engineer of the company, told me that he had studied the subject pretty thoroughly before going into the business, and had come to the conclusion that it did not pay to attempt to hydrate your own lime. He said that by using lime that had been hydrated, it not only made a clean factory, but the bricks were always free from the unsightly lime spots so common to the ordinary sand-lime brick. Upon investigation I found this to be true, for each brick was as clear and clean and as perfect as it is possible for a brick to be.

We hear so much of model plants that turn out to be far from perfect that it was a positive pleasure to be shown through this factory. If my advice is ever asked, which I presume it will not be, as to my opinion as to the best machinery for a sand-lime brick plant, I will say, get your boilers from the Sterling Co., your engine from the Allis-Chalmers Co., and your brick machinery, which, of course, is the plant itself, from the Semisteel Company of Cleveland, O. In other words, duplicate the Sandstone Brick Co.'s plant at Schenectady, N. Y.

SAND-LIME BRICK EXPERT.



A Sand-Lime Brick Chimney.

BRICK PLANTS CONSOLIDATE.

L. P. Haldeman, vice president and general manager of the Louisville & Kentucky Firebrick Co., left Louisville, Ky., for Haldeman, Ky., and from there will go to Frankfort to secure the incorporation, under the laws of Kentucky, of the Kentucky Firebrick Co., with a capital stock of \$125,000, to take in a number of plants in Pennsylvania, the plant at Haldeman, Ky., and later on to erect a new plant at Haldeman, which is 51 miles south of Ashland and where the new company will control 2,500 acres of land rich in clays and minerals. Under the new organization, Mr. Haldeman will be secretary and treasurer. There are about a dozen plants included in the consolidation.

GERMAN PORCELAIN: PROGRESS IN PRODUCTION.

Consul Slocum, of Weimar, writes interestingly about the porcelain producers of the German Empire, laying emphasis upon the work being done in his own district in the hills of Thuringia. The progress in the past, the fairly prosperous condition of the industry, the successful efforts in improving the methods of production and in securing outside markets are dealt with in a way to suggest the importance of emulating the empire. Mr. Slocum writes:

The successful experiments of Johann Friedrich Bottcher, resulting in the invention of Saxon porcelain early in the eighteenth century, were not without a direct influence upon the present prosperity, industrially and commercially, of this portion of the great German Empire. Several influences contributed to the establishment of porcelain factories in Thuringia, though precedence should doubtless be given to the desire of each and every state's sovereign to possess a factory of his own. Thus, as King Frederick of Prussia had works at Berlin, so did the King of Saxony possess the celebrated manufactories at Meissen, and their example was emulated by the sovereigns of the several states and principalities. It was not until the latter part of the eighteenth century, however, that, encouraged by the sovereign authority, grants of land for prospecting purposes and practically free wood fuel, primitive works were established in Thuringia. The natural resources of the district, i. e., a suitable clay and a plenitude of wood for fuel purposes, supplemented by the reigning sovereign's aid in the granting of monopolies, the low cost of raw materials, the high prices obtainable for the finished article, all gradually brought about a condition profitable and satisfactory at least to the producer. In those early days Steinheider clay was used in all of the factories and was obtained near a small hamlet of that name (Steinheid) in Thuringia, near Sonneberg. The output of the factories was infinitesimal, very expensive, and of decidedly poor quality.

Need of Technical Knowledge.

Intense ignorance prevailed as to the art and the technical details of manufacture, and such of the secrets of process as existed were handed down from generation to generation of employers and retained as a family asset. Up to 1870 technical men were not employed, but from that year dates the remarkable progress in the art which has made Germany the competitor for the world's trade. The successful conclusion to the war with France marked an advance probably without parallel. In it the manufacture of porcelain kept pace with the march of progress. The element of science entered into all manufacturers and all were conducted on a larger scale. Technical schools were opened, and to-day one can find graduates capable of filling vacancies in any department.

Output and Hands Employed.

A conservative estimate places the number of porcelain factories of prominence in Thuringia to-day at 50, giving employment to 13,000 hands. The total output of these

factories runs between \$4,760,000 and \$6,950,000 yearly, with a consumption distributed, roughly estimated, as follows:

Germany	\$1,000,000
Continental Europe	1,500,000
United Kingdom and colonies	1,000,000
United States	1,500,000
Latin America, Africa, and Asia	500,000

The obvious facts shown by this conservative statement are that Thuringia finds a market for less than one-fifth of her entire porcelain manufactures at home, and that the consumption of her wares in the United States is only equaled by the whole of Continental Europe. The table also shows an increase in manufacture in the ratio of 3 to 1 over the quantity produced in 1870.

While the bulk of the manufactured articles are of the cheaper standard qualities, the ornamental china of Thuringia ranks with the best of Germany's producers and has but few foreign equals. In this connection it may be said that prior to the "country of origin" requirement many Thuringian wares were presented for sale in the United States as of French origin.

The Export Trade.

Good models, great variety in articles, and cheapened prices may be considered the principal causes of the remarkable increase in demand by the foreign markets. The export trade to the various countries previously mentioned remains now relatively the same from year to year, with the exception of that to the United States. England especially demands chiefly staple lines, and no particular difference in volume of business is to be noted when the one or two new shapes introduced by every manufacturer yearly fail to meet with popular favor, whereas, on the other hand, the sales of the United States are immediately affected thereby. In such years the shipments from this consular district have fallen to one-half the usual quantity.

The rapid changes in taste in chinaware in the United States are not without their effects upon the Thuringian factories, certain colors and even shades of colors possessing at times a power to make or mar the American trade for the year. The American buyers have produced an impression in this district as possessing a more intimate and thorough knowledge of their business than any others, and their "shopping" tendencies have had a decided result in the lowering of the scale of prices, especially in late years. However, American orders are much sought after, particularly so as American houses help out by giving what are known as "winter orders," and thus what would otherwise be considered the dull season is sometimes quite active, though the sales are naturally made at reduced prices. Better prices in general are obtainable in the various European markets, but the size of the American orders, coupled with prompt payments (in general thirty days from date of invoice) and the discounting of bills, make the American buyer practically a necessity to some of the factories.

Suffering from Overproduction.

The perhaps too rapid strides made by the German manufacturers in respect to the quantity of production and the

addition of many newly built factories during recent years have produced a state of affairs not entirely satisfactory to the manufacturer. There is no question but that this market suffers from overproduction and the resulting low prices necessary to obtain orders, coupled with the strong competition now felt from the reduction of prices for French and Bohemian wares, and an increase in the cost of raw materials, fuel, and labor have produced a condition whereby the large dividends of a few years ago are no longer possible. The decline in prices has led to an agreement, renewable every five years, among the various manufacturers, whereby minimum selling prices for certain staple articles were established. I am informed that the agreement had the desired effect.

Cost of Labor.

The increase of cost of labor is such that men workers in the factories now receive from \$0.714 to \$0.952 per day, and women workers \$0.476. In general the help are satisfied. The prospects of serious trouble from "strikes" are greatly minimized by a certain protective measure taken by the allied manufacturers. Upon a statement of grievance by a labor organization or other body the manufacturer presents the case in toto to a committee of the manufacturers' association, and if sustained and strike is declared by the workmen every manufacturer in the association is bound by his agreement to shut down his works until the matter is adjusted. The plan seems to work well from the manufacturers' point of view; but the discontented among the workers are in reality rare.

The outlook for the Thuringian factories under the present conditions in the porcelain trade does not in general seem a poor one, but the necessity for more than one "open door" for Geramny's export trade must seem apparent to even the most casual observer.

ELABORATE AND HAPPY BANQUET GIVEN JOHN B. ROSE BY NEWBURGHERS.

A number of the leading citizens of Newburgh, N. Y., who for several years have been enjoying the hospitality of the John B. Rose Hot Air Conventions in New York city, and who have a warm, neighborly feeling for Johnnie B., tendered his royal highness, the grand high potentate of the brick industry, a dinner at the Palatine Hotel in Newburgh, that for substantial results, which not only included the magnificent menus as prepared and served by proprietor Bain, but the munificence of the good fellowship displayed, is reported by the *Newburgh Register* as having been beyond hailing distance by anything heretofore held in the hillside city.

Mr. Rose's recent flying trip to Europe and his happy return to Newburgh with his statement that Newburgh was to him the oasis in the desert of life, furnished a happy inspiration to the Rose contingent with the banquet as a result.

The printed reports disclose that not only did the blooming John B. of the rose variety distribute rare fragrance in the evening but the other flowers from the various walks of every-day life assumed entire charge of the hotel for the evening.

About twenty-five of Newburgh's citizens were fortunate enough to be of the party. The banquet was held in the Turkish room and from a round table in order to prevent any special positions of honor. The scene and incidents as described by the *Register* in part are:

"The table had been arranged to represent the Hudson River. Artistic arrangement of mirrors accomplished this for the foundation, and the cut glass pieces served as islands. Miniature ducks were placed here and there to give effect, while at each of the twenty-five covers was moored a brick barge bearing the name of the banqueter. At the extreme south, to which had been assigned the guest of honor, was an immense tug, bearing the name of Jack Rose. Each of the brick barges had been attached to the tug with a rope of smilax, by the side of each plate was a hammer, and floral decorations were prettily distributed where they would not detract from the marine scene.

The only things barred from the feast were snuff and water.

At each cover was a souvenir menu of the evening. It was of red brick, 8x12 inches in size, bearing on the cover a panel, surrounded with rope, on which appeared this inscription:

Naughty-Cal Dinner
given to
Jack Rose,
Lord of Roseton, Mover of the Earth,
Admiral in Command of the
Roseton Brick Barges,
by the
Officers and Crew of the Flagship
Jack Rose,
at the Palatine, Newburgh,
Saturday, March 24, 1905.

At the foot of the panel was a perfect representation of the power boat that Mr. Rose is having built for his pleasure, which is said will be the fastest yet put on water. Within the cover were a number of printed pages. The first bore a fine half-tone portrait of the guest of the evening. Silhouette pictures at the corners of the page presented him as he appears 'As a Minstrel' at Roseton; in Gay Paree, the Crest of Lord Roseton, being a moth with wings singed from a blazing gas jet; the Semi-Annual Dividend being a barrel overflowing with coin.

"Silhouettes enlivened the menu page. They were designated: 'Brick going up'; '200 per cent'; 'Who's shy'; 'Everybody Puts Up but Pop'; 'The Wind Up'; 'The Morning After'; 'The Real Thing'; 'A Tip.'"

William H. Colwell was the presiding genius and was the author of several sonnets on John B. and leading citizens. The banqueters joyfully joining in the refrain:

Johnnie B., Johnnie B.,
If you have to work, don't kick,
For your making high priced brick.
Johnnie B., Johnnie B.,
Darn 'em, swamp 'em, get their wampum,

Fowler—The brother, with a Dent in his name,
Came up to Newburgh to get onto the game.

Wilson—The Salt, made her ladyship shiver,
When he tried auto sailing on the Passaic River.

Burne—Is the neatest of all men around,
Who'd think in a clay bank he'd ever be found?

McClung—A Lawyer, for some things quite famed,
Is a rank Democrat and should be ashamed.

Fowler—From Haverstraw, we don't know well,
But we trust of our doings he never will tell.

Odell—He is "boss" of the ice "machine,"
But whatever you want he has to be seen.

THE IOWA BRICK AND TILE ASSOCIATION GETS THE COURSE IN CERAMICS PASSED BY BOTH HOUSES.

Through the work of the committee appointed by the Iowa Brick and Tile association and especially the chairman of this committee, J. B. McHose of Boone, both the house and senate have passed a bill authorizing a ceramic course at the Iowa State college. This course will include an investigation into the art of clay making and ceramics including the manufacture and use of cements and allied industries. Mr. McHose went to Des Moines a number of times in the interest of the bill and found very little opposition. The bill has been sent to Governor Cummins for his signature. A copy of the bill, known as House File No. 360 by Ritter, follows:

A BILL.

To provide for the establishment of a course of practical and scientific instruction and investigation in the art of clay working ceramics including the manufacture and use of cements and allied industries in the Iowa State College of Agriculture and Mechanic Arts.

Section 1. Be it enacted by the general assembly of the State of Iowa that the trustees of the Iowa State College and Mechanic Arts be, and they are hereby required, to establish in said college a department of ceramics for the technical and practical education of clay workers, cement manufacturers and users and other allied pursuits in all branches of these arts which exist in this state or which can be profitably introduced and maintained in this state from the mineral resources thereof; including the geology and properties of clays, cement materials, fuels, and other minerals required, and the testing of the products thereof; also the manufacture of fire brick, pressed brick, paving brick and of glazed and enameled brick of all kinds, of sewer pipe, drain tile, fire proofing and terra cotta, of pottery, porcelain, china, and other specialties; also including the details of the manufacture and uses of cement and the details of other allied industries.

Sec. 2. Be it further enacted, that the said college shall provide as a part of its engineering experiment station work for the investigation of clays, cement materials, fuels, and other mineral resources of the state with especial reference to their economical uses, and for the publication and dissemination of information useful to such industries and for the testing the products thereof.

MR. OSCAR ZIMBAL GETS MARRIED.

The marriage of Oscar S. Zimbal, the well known brick manufacturer of Sheboygan, Wis., to Miss Anna Tweig, is announced. The ceremony was performed a few nights ago at the home of the bride on Erie avenue, by Rev. J. J. Janet of the Reformed church. The couple was attended by Miss Emily Hoppert and Herman Koehler. Only the immediate relatives were present. A reception and spread followed the ceremony.

Mr. Zimbal is a member of the O. Zimbal & Son, brick yard owners, succeeding his father at the head of the company. He is also the treasurer of the Wisconsin Clay Workers' Association. His bride is a popular young lady in her circles. The couple have taken up their residence on Georgia avenue.

THE RUST CLAY FEEDER.

The Rust Clay Feeder made by the Marion Machine, Foundry and Supply Co., of Marion, Indiana, has been brought out in response to the demand for a better method for mixing and feeding clay in clay plants of all kinds and especially brick and tile plants. It has been in successful operation for three years. The saving in labor, increase in the production and improvement in the product makes it a necessary adjunct to a clay plant.

It is a saving of labor by its use the time of one and sometimes two men are saved, the clay being dumped direct from the clay car into the hopper of the Clay Feeder.

The clay is tempered by the spirals, which you see in the illustration. It is evenly supplied to all parts of the hopper. The feed is very regular, preventing choking. This naturally tends to improve and increase the output. The feed may be varied by raising the front of the hopper or by increasing the speed, the actual power required in most places is not over two horse power, and this amount is saved to the other machines, because of the regular feed. The durability of the Feeder is unquestionable and it is made of the best of materials.



Cut showing dump car in position to dump clay into machine. Also showing front of hopper where capacity can be increased.

The operation of the machine is automatic. The construction of the hopper is such that the clay does not clog up, and feeds down on to the spirals by its own weight. It requires no attention after the feed to the disintegrator has once been regulated. The spirals are nine inches in diameter. The diameter of the main driving pulley is forty inches. R. P. M. 70. The body is constructed of 6-inch channel irons, and the hopper of heavy sheet iron, reinforced with angle iron at top. The spirals are made in one solid

piece, and rigidly fastened to the shaft by a patented process.

The Rust Clay Feeder dispenses with the men ordinarily used to feed the clay into the disintegrator. This saves the time of from one to two men, who will draw from \$1.50 to \$4 per day, according to the local rate and amount of work. The average saving will be about \$2.25 per day. Counting 250 working days in the year, this means a saving of \$562.50 where one of these machines is used, a return of over 100 per cent on the investment. Not bringing into account the great value in tempering the clay, and the regular feeds on the machinery, thereby saving their bills and costly delays.

This machine is constructed to feed direct into the disintegrator, but where it is desired to convey the clay off to one side, a cross spiral attachment is used, which is attached to the end of machine, and is operated by means of pulleys and belt.

Alex A. Scott, president and general manager of a brick plant at Knoxville, Tenn., which just booked an order for 10,000,000 brick on account of their superior quality over the competing firms, says: "After eighteen years' experience in brick making that in his opinion there is no piece of

WORKINGMEN'S INSURANCE AND EMPLOYERS' LIABILITY.

The Bureau of Labor, Washington, D. C., is preparing a report covering the various systems of workingmen's insurance and employers' liability both in this country and abroad. The report will cover insurance against sickness, accident, disability, old age, death and unemployment.

In this connection it is endeavoring to secure information concerning the existence in the United States of what are usually known as establishment funds—that is, mutual relief or insurance funds organized and maintained by the employes of an industrial establishment, or relief funds supported either wholly or in part by the employers themselves. It is desired to obtain, wherever possible, copies of constitutions, rules and by-laws, blank certificate forms, and any other matter relating to funds of this character. In the absence of other data the name and location of establishments in which such funds exist are desired.

Persons possessing data of any kind relative to the existence of establishment funds in this country should communicate with Charles P. Neill, Commissioner, Washington, D. C., at their earliest convenience.



Top View of Rust Clay Feeder with Box Removed.

machinery used in the manufacture of brick that is more essential to results than the Rust Clay Feeder. It saves men and the regularity in which it furnishes the clay is a great advantage."

Eb. Rogers, manager of the large paving brick plant at Alton, Illinois, says it works in a very satisfactory manner. It is set for 40,000 brick per day, and it feeds this amount in a regular steady stream. We do not think our drying outfit would work without it.

Mr. J. M. Leach of Kokomo, Ind., says he is making 25,000 brick per day of seven hours, and the machine would feed as many more, that is, does not add to the horse power of the plant, because it takes the load off the disintegrator. He is installing a new plant and will want the second feeder soon.

You can get further information about the Rust Clay Feeder by writing to Marion, Ind., and mentioning THE CLAY RECORD.

Messrs. George H. Clippert & Bro. Brick Co., Detroit, Mich., are installing the latest Improved "Martin" Patented System of handling and drying soft mud brick of 33,000 capacity.

CHICAGO HEIGHTS BRICK COMPANY.

In a recent issue we announced that a new brick industry was about to be launched in Chicago Heights, Ill. It now appears that our information was correct in every detail.

The Chicago Heights Brick Company have organized with a paid up capital of \$100,000, and have purchased forty acres of the Ross Morris farm, southeast of the city, adjoining the property owned by the National Brick Company.

Arrangements have been made for the laying of a switch track to their holding and the work will be commenced at once and in all probability they will begin shipping brick the last of June or first of July.

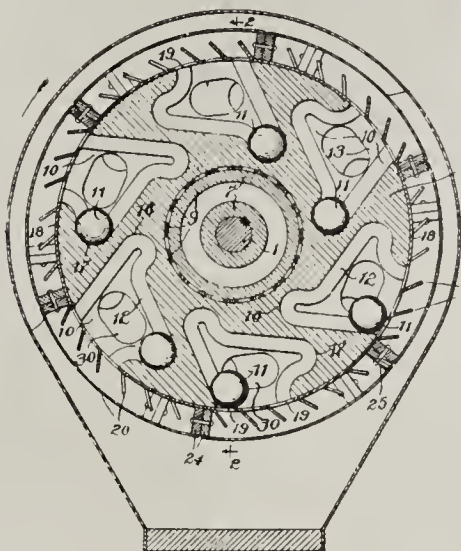
As already stated in our previous issue this company is made up entirely of Bohemians and are all architects, contractors or builders, and propose to make bricks for their own consumption principally. Mr. Frank Layer, 1327 Millard avenue, Chicago, is the president of the new concern.

This new enterprise will employ in the neighborhood of 125 men, who must have houses here, and something will have to be done, if not at once, in the near future, to relieve the present scarcity of dwellings.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

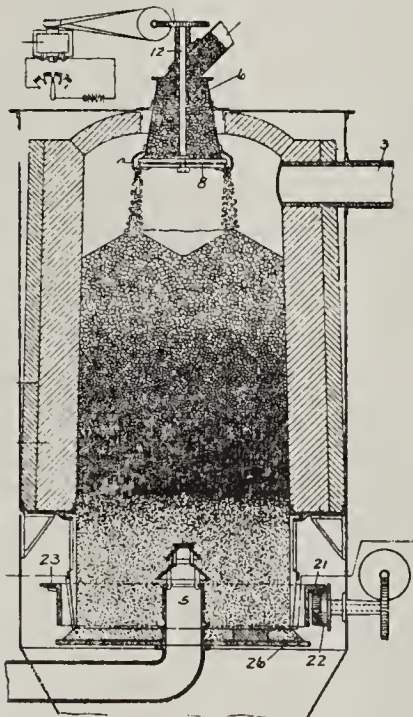
812,231.—Pulverizer. George Raymond, Chicago, and John H. Finlay, Warsaw, Ill. Filed July 26, 1902. Renewed May 31, 1905. Serial No. 263,152.



Claim.—In a pulverizing-mill, the combination with a rotating drum having pockets, of peripheral openings in said pockets, peripheral scoops adapted to guide material to said openings, tumblers confined within said pockets, and a screen surrounding said drum and rotating therewith, substantially as described.

813,600.—Gas Producer. Edward N. Trump, Syracuse, N. Y. Filed Nov. 21, 1904. Serial No. 233,609.

Claim.—The combination of a stationary receptacle comprising a cylinder having a vertical extension and a table spaced below the lower extension of the cylinder, a deflector projecting beneath the cylinder and over the table, a support for said deflector located without the receptacle, and means for causing the said support to travel around the receptacle.

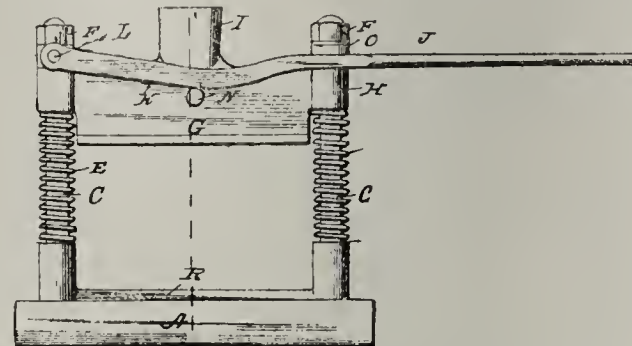


In a continuously-operated gas-producer, the combination with regulatable mechanism for feeding fuel thereto, a combustion-chamber, a stationary table spaced below the lower extension thereof; a deflector adapted to rotate about an axis corresponding to the center of the table, a member, located outside of said chamber for supporting the said deflector,

and means for causing the gradual rotation of said supporting member.

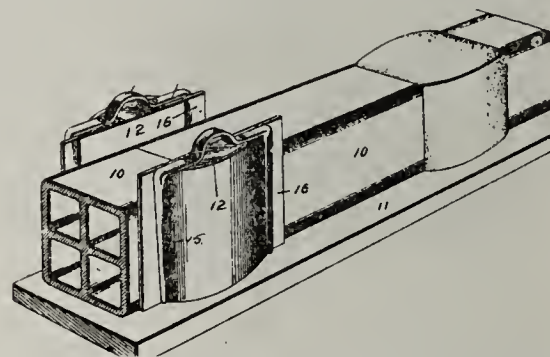
812,973.—Brick-Cutting Machine. Harry L. Barr and Fredrick Gandert, Mansfield, Ohio. Filed Aug. 3, 1905.

Claim.—A brick-cutting machine, composed of a suitable metal base, posts, secured in said base, one upon each side of the center, a lateral steel cutter secured in said base on a line with the center of the posts, an upper adjustable cutter,



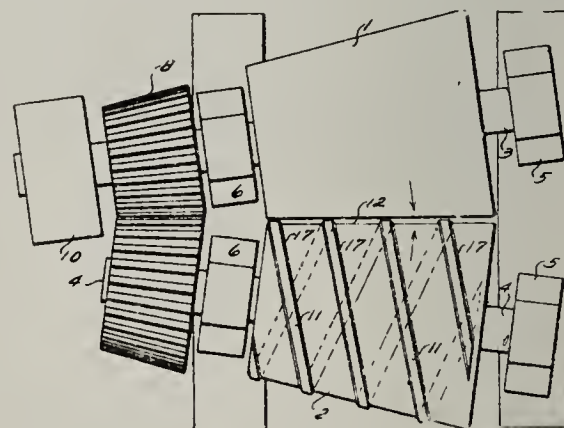
provided at each end with a hollow sleeve, said cutter adapted to have a vertical sliding movement upon the vertical posts, and supported upon suitable coil-springs surrounding said posts, the said posts threaded at their upper ends and provided with adjusting-nuts, a lever journaled upon each side of a loose sleeve placed upon the vertical post between the upper cutter and adjusting-nut.

815,237. Conduit-Sealing. Joseph W. Turner, Schenectady, N. Y. Filed Nov. 26, 1904. Serial No. 234,353.



Claim.—In a conduit-sealing device, a core formed with one face shaped to lie flat against the sides of two abutting conduit-sections, a retaining-sheet fitted to the opposite side of the core with its edge margins shaped to lie flat against the sides of the conduit-sections beyond the core, and means for detachably securing the sheet to the core.

813,273.—Brick-Clay-Crusher Rolls. Julius H. Bach, Chicago, Ill. Filed Feb. 6, 1903. Serial No. 142,181.

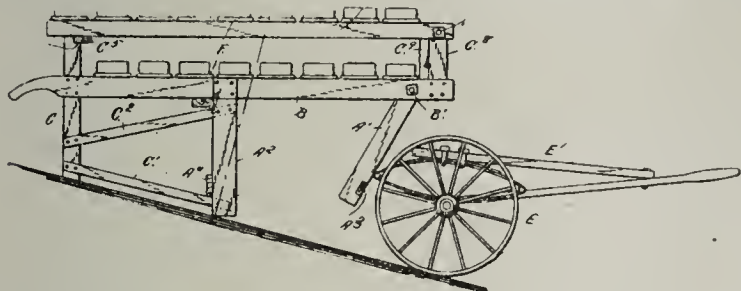


Claim.—An apparatus for crushing clay and removing the stones therefrom, comprising a supporting frame; a pair of coating crusher-rolls, one of same having a ridge extending spirally around and along its periphery, the width of the space between adjacent spires of said ridge being considerably greater than the height of the ridge, whereby said ridge is adapted to eject stones by discontinuous impulses, and

the other roll having opposed to and coacting with the spirally-ridged part of the first roll, a periphery unbroken by ridges or depressions, and means for simultaneously revolving said rolls; one of said rolls being geared to revolve at different peripheral speeds than the other, substantially as described.

814,966. Portable Brick-Drying Rack. Charles R. Knight and Jacob Tennesen, Denver, Colo. Filed July 25, 1904. Serial No. 217,966.

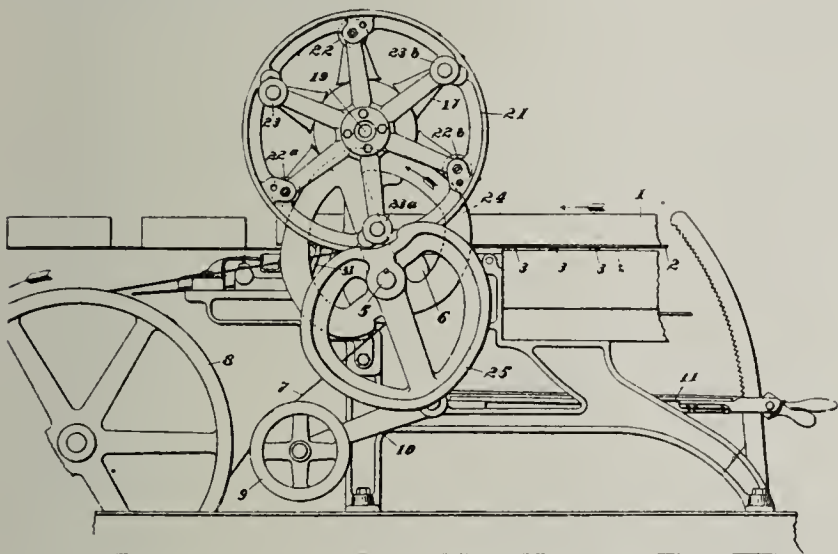
Claim.—A brick-drying rack composed of a pallet-supporting deck, forwardly-located hinged legs, and a pair of rearwardly-located legs, located rearwardly of the center of the rack when the deck is in a horizontal position, the rack being also provided with a rearwardly-located part whose



lower extremity is above the ground or other supporting-surface when the deck is in a horizontal position, the arrangement of the said parts being such that when the rack is tilted rearwardly to cause the said rearwardly-located part to engage the ground or other surface, the center of gravity of the rack or the rack and its load is thrown to the rear of a line passed through the point where the rear legs of the rack engage the supporting surface.

815,022. Cut-Off Mechanism for Brick-Machines. Howard K. King, Philadelphia, Pa., assignor to Chambers Brothers Company, a Corporation of Pennsylvania. Filed Jan. 18, 1905. Serial No. 241,589.

Claim.—In combination with a brick-machine comprising means for forming and moving a continuous bar of plastic material, cam-operated wire cut-off mechanism controlled by the travel of the bar.

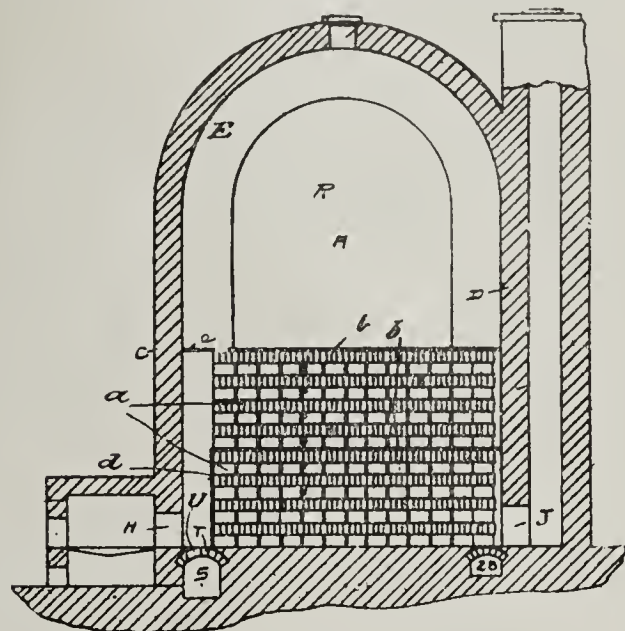


In combination with a machine for forming and moving a continuous bar of plastic material, a cut-off wire and means for causing the same to cross the path of travel of said bar, a carry-off belt for the severed sections of said bar, a delivery-plate adapted to be moved from one to the other, with the required dwell in each, of the following positions, the position in which first is received the severed section, then delivers the severed section to the carry-off belt, and then drops out of the path of travel of the cut-off wire, and cam-operated means for causing such actuation.

816,385. Method of Treating Plastic Material. Alexander A. Scott, Knoxville, Tenn. Filed Oct. 12, 1905.

Claim.—The herein-described method of treating plas-

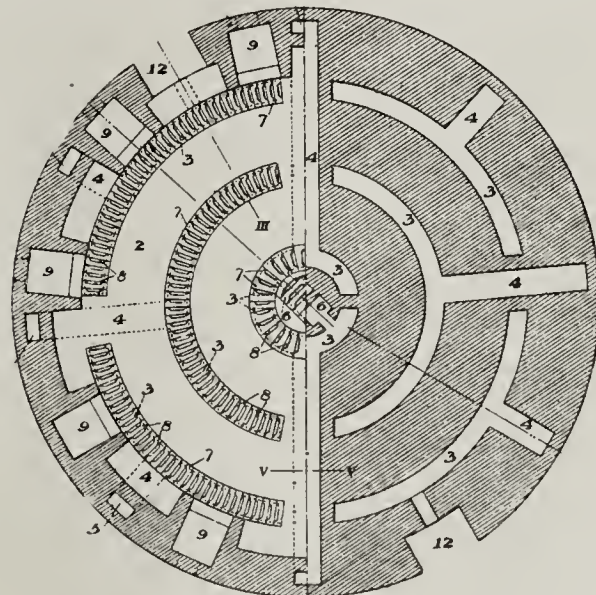
tic material, which method consists in forming said material, in the green state, into blocks; then setting said blocks in a plurality of superposed groups; each successive group being subjected to the action of an artificially-moved drying agent before another group is set thereon; and then subjecting the entire mass of said blocks to a high temperature, substantially as and for the purpose herein described.



The herein-described method of treating plastic material, which method consists in forming said material, in the green state, into blocks; then setting said blocks in a compartment, in a plurality of superposed groups; each successive group being subjected to the action of an artificially-moved drying agent before another group is set thereon; then subjecting the entire mass of said blocks to the action of highly-heated products of combustion; then, while the last-mentioned step is in progress, setting more of said green blocks in a second compartment, in a plurality of superposed groups, each successive group being subjected to the action of the heated gases conducted from said first-mentioned compartment; and then subjecting the entire mass of said blocks in said second-mentioned compartment to a high temperature, substantially as and for the purpose herein described.

815,189. Brick-Kiln. John Manypenny, New Brighton, Pa. Filed Oct. 4, 1905. Serial No. 281,220.

Claim.—In a downdraft brick-kiln, a series of concentric circular flues in the floor of the kiln, the inner one of said flues having short enlarged flues extending inwardly there-



from to the center of the kiln, and providing for an effective central draft, and removable covers for the said flues; substantially as described.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico
and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the sub-
scribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII.

APRIL 16, 1906.

No. 7

"I like to read American advertisements. They are in
themselves literature, and I can gauge the prosperity of the
country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the
very time that advertising should be the heaviest. Ninety-nine
out of every hundred merchants advertise most when there is
least need of it, instead of looking upon advertising as the pan-
acea for their business ills.—John Wanamaker.

Subscribe for THE CLAY RECORD now.

The suspicious man keeps one eye on his neighbor, but
the wise man keeps both eyes on himself.

Unless a man is willing to take chances he never takes
anything else that happens to be lying loose.

Don't merely scrape the surface of your business chances.
Probe them. Then take off your coat and dig.

In the proverb competition is the life of trade, but an
overdose proves its death. If your competitor allows com-
petition to blind him to his own interests, don't try to fol-
low him unless you are sure he will get the overdose before
your turn comes.

The readers of THE CLAY RECORD are assured that this
paper does not garble the reports of any of the meetings
recently reported by it, so as to suit or fit any class, tribe
or set. It speaks the truth, no matter where it hits or
who it hits. The recent report of the Illinois Clay Work-
ers' meeting plainly shows this. If you are not a regular
reader now, subscribe for it, only one dollar per year.

In this issue will appear about the last reports on the
several conventions held during the winter in the interests

of the Brick Making Industries. It is to be hoped, as these
reports have appeared in recent issues of this paper, our read-
ers have carefully read them, and particularly the interesting
thesis prepared by experts, the latter being cut out and
filed away along with other valuable data acquired in the
past to be available when one wishes to post up. No doubt
this is the practice of all our readers, but we are prompted
to make the suggestion that it be done, because of certain
experiences we have had.

It will be a surprise to many, yet a fact, nevertheless, we
frequently receive letters from our readers asking for in-
formation along certain lines, frequently questions of a
technical nature, the information and the questions had
been given and answered in previous and recent issues of
this paper.

This would seem to mean that either no attention was
paid to the articles when they appeared, or were not appre-
ciated at the time. However this may be, while we always
gladly give attention to these requests and endeavor to
thoroughly satisfy them, we strongly urge that all of our readers
shall practice the cutting out and preserving these valuable
reports.

The trade papers are frequently rebuked because they
"mix in politics," and their critics say they (the trade
papers) should keep out of politics. Very good, if what is
included in the term is understood and agreed upon; but
"there is the rub," what is comprehended in the term?
Everything is undergoing change; religion, science, politics
are not the same yesterday, today and not to be forever
the same. Whether one be interested, or not interested, un-
less he be blind or be a fool, must see that the politics of
today are unlike those of the last generation. The busi-
ness interests are so sensitive in these days that the least
adverse influence affects them; and it is often the case this
influence being slow in action and subtle in its nature and
only to those whose business it is to keep in touch with things
in general is it known when the aforesaid influence began
its working; and to them only is known the hidden dan-
gers covered up, and those whose business this is, are the
publishers of industrial and technical papers. On them de-
volves the duty of watching the signs of the times detecting
and anticipating dangers and warning their clients accord-
ingly. In doing this, it is necessary often to criticise sharply
men high in governmental affairs; to discuss principles, op-
posing them, and in doing so antagonizing either or both
leading political parties, and because of this the cry goes up
to the effect the "Trade Journal" must keep out of politics.
but we think we have shown that with the proper and cor-
rect interpretation of the term, the Trade Journal Publisher

has an unquestioned right "to say his say" in the interest of his clients. Why should the tariff question be regarded as one with two sides only, and that one or the other of the political parties should line up as antagonists to maintain their respective sides? Is not the question one in which the welfare and prosperity of the whole people are involved? And, if so, then determined accordingly independently of parties, political, or of any kind? The general business interests today are actually suffering because of the present status of this question, and our talk is to interest our readers on the subject that they may arouse themselves, become interested and excited over the subject, and then go after their Congressman, demanding legislation on this subject at once. This is not politics, as we understand politics to be, but simply the discharge of a duty we owe to our readers and our friends, and it is on their good judgment sustaining our position that we rely on talking politics (?).

A DEATH STRIKES THE WALLACE MFG. CO.

The Wallace Manufacturing Company of Frankfort, Ind., sustained a great loss in the death of their Secretary and Treasurer, James McClamroch, whose demise occurred on March 31st.

Mr. McClamroch was one of the principal stockholders in the company and was one of the wealthiest and most respected men in Clinton County. At his death he carried \$101,000 life insurance.

His loss will not only be felt by the Wallace Mfg. Co. but by Clinton County as well. He was a man well known and liked by many of central Indiana.

FIRE! FIRE!! FIRE!!!

Fire destroyed the building containing the boilers at the plant of the Mankato Cement Company, Mankato, Minn., causing a \$1,000 loss.

A fire of unknown origin completely destroyed the plant of the Union Brick and Tile Company at Dawson, Iowa. The loss was \$15,000, insurance \$3,500. Witter & Son, the owners, may not rebuild the plant, but purchase one at Perry.

The plant of the Zeeland (Mich.) Brick Company on the South Harm division of the Michigan Central Railway, near Kalamazoo, was totally destroyed by fire, causing a loss of \$20,000. No insurance. The company is owned by the Vancklasen Bros., who have plants at Zeeland, Hamilton, Cloverdale and Grand Rapids, Mich.

The American Refractories Co., Frick Building, Pittsburgh, Pa., are building a \$75,000 plant at Rockdale, a suburb to Joliet, Ill. The local office is in the Barber building at Joliet. Emil Winter is president, David M. Kirk secretary, who, with E. M. Allen, B. J. Jarrett and W. F. McCork, are the directors, all of Pittsburgh.

ACCIDENTS, DAMAGES AND LOSSES.

The plant of the Callery Junction (Pa.) Brick and Tile Co. at Callery, Pa., has been sold at sheriff's sale to Joseph R. Thompson, secretary of the company, for \$6,500.

John I. Gambrel of Coffeyville, Kansas, has brought suit against the Standard Brick Co. for \$5,225 damages for injuries sustained while in the employ of the company.

A collapse of a shed at the plant of the National Brick Co., Chicago Heights, Ill., three men were injured, so that they were taken to the hospital, and several others slightly.

John Taylor, a 11 year old water boy for the Bibb Brick Co., Macon, Ga., has sued the company for \$5,000 damages for the loss of a leg, which was lost in an exposed cogwheel.

John L. Juday and William B. Barnard have filed a bill for a receiver for the Millersburg (Ind.) Brick and Tile Company. The plant has not been run for the last three years.

An attachment in an action of tort for \$7,500 has been filed by Teresa Buttieri against the Hampton Brick Co., Springfield, Mass. The suit is for death of her husband in a cave-in.

James White for the past 22 years holder of the contract for furnishing clay to the Chicago Retort and Fire Brick Co., at Ottawa, Ill., was run over and instantly killed by the Rock Island train.

P. B. Broughton, the well known brick worker at Bradford, Pa., sustained a fracture of his left leg as a result from a fall. The fracture is serious, and Mr. Broughton will be laid up for several weeks.

One of the Pat Bamon heirs has asked that a receiver be appointed for the Kentucky Vitrified Brick Co. and the Louisville Vitrified Brick Co., both of Louisville, Ky., and mostly owned by the Pat Bannon estate.

J. B. McHose, Boone, Iowa, filed bill to have a receiver appointed for the McHose Bros.' Brick Works. The plant was sold by Mr. McHose four years ago to Arthur and Harry H. McHose for \$14,000, none of which has been paid. P. Brady was appointed.

A. H. Mitchell, 56 years old, Cumberland, Md., had both of his legs ground off in a rapid running cogwheel of a machine at the plant of the Queen City Brick and Tile Co. He was attempting to tighten a set screw on the machine and his clothing caught and his legs were drawn in.

Forty-eight different actions have been commenced in the Supreme Court of Rockland County, N. Y., against the Excelsior Brick Co., of Haverstraw, Lucien Washburn and Everett Fowler for damages caused by the recent landslide at Haverstraw. The amounts range from \$10,000 to \$50,000.

The Henry Martin Brick Machine Manufacturing Company, of Lancaster, Pa., are installing their Latest Improved Patented System of handling and drying soft mud brick on the plant of Mr. W. H. Carbaugh, New Oxford, Pa.

LOUISIANA BRICK MANUFACTURERS FORM A STATE ASSOCIATION.

The brick manufacturers of Louisiana have organized a state association.

F. Salmen and C. N. Adams, who have attended several sessions of the national association, worked up the interest in the state organization, and sent out the call for the meeting here. The purpose of getting together is to exchange ideas and to bring about uniformity in the size of brick manufactured. This is a very serious question with the architects and builders, because a man drawing plans or figuring on a contract in another city is not always informed as to the size of the brick obtainable in that place, and this brings about considerable trouble sometimes. The question of improvements in the manufacture is another vital one with them, and some of the manufacturers have been making experiments with oil and coal for burning the brick.

There were a score or more manufacturers from different parts of the state present. Mr. Salmen presided, and Frank Bethune acted as secretary. They were elected temporary officers, and a committee of five was appointed to draw up a charter and by-laws. This committee consists of R. A. Kent, E. N. Loeb, E. Gandran, C. N. Adams and Thos. Babin.

When this committee has finished its work Mr. Salmen will call the association together and permanent officers will be elected.

CHICAGO BRICK MACHINERY CO.'S 1906 CATALOGUE.

Just inside the beautifully designed cover of the Chicago Brick Machinery Co.'s Catalogue is the photo of its president, John J. Morrney, while Mr. Morrney has lost several pounds in weight within the last few months, he still knows how to get out something attractive both in catalogues and machines. He first describes general points on brick making, then takes up the Dry Press System, and showing both the front and rear views of the Berg Dry Press, its points of excellence, etc. A sketch and description of the Berg Mold Table follows.

The stiff mud machinery from large sizes down to very small ones are all catalogued. Then cutting tables galore are illustrated. The Canton Repress is one of their stand-bys.

Soft mud machinery and all kind of supplies that are used on any kind of a yard are not neglected. Better send for one to 77 Jackson Boulevard, Chicago. Mention our name and it will be forthcoming.

TERRA COTTA COMPANY NOW MAKING BRICK.

The Atlantic Terra Cotta Company, of Tottenville, L. I., N. Y., has installed a new department at its works, that of making brick. The first of this article to be made will be what is known as white glaze front brick and will be used on the new addition to the Plaza Hotel in Manhattan, for which the Tottenville company has the contract to supply the terra cotta, which will also be of a white glaze variety. For the contract \$30,000 worth of brick will be made.

THE STANDARD BRICK MACHINERY COMPANY BUYS THE HUENNEKES SYSTEM.

As our readers will see by the advertisement on another page in this issue of THE CLAY RECORD, the Standard Brick Machinery Company has been organized and has bought all of the rights, title and interest in the Huennekes System and the other valuable assets of the H. Huennekes Company, and are now doing business at the old stand, 114 Liberty Street, New York.

Colby M. Avery, M. E., whom the writer has known for forty years, has been engaged to take entire charge of the engineering department. New plans for factories have been prepared far superior to any plans yet offered to the public. This alone makes the new company a success from the start.

Frank A. Crandall is the president of the company. He is not only a business man but a gentleman in every sense of the word. Mr. St. John Clark is vice-president and Mr. John F. Wilbur secretary and treasurer, all high class business men. The personnel of the company is excellent and merits the confidence of the public.

PAT BANNON HEIRS AT LOGGERHEADS.

A suit growing out of a difference between the heirs of the late Pat Bannon, Sr., who died recently, leaving an estate valued at \$500,000, was recently filed in the shape of a prayer for the appointment of a receiver for the P. Bannon Sewer Pipe Company, and an injunction against M. J. Bannon, the vice-president and acting president of the concern. The plaintiffs are R. B. Bannon, Gertrude O'Connor, Mollie Burrell and Lillie Hardesty, all children of the deceased, and the defendants are M. J. Bannon, the company, the Louisville Trust Company, administrator of Pat Bannon, and a number of small stockholders in the concern, who are also grandchildren of Pat Bannon, Sr., deceased.

It is alleged that the assets of the Pipe Company amount to \$300,000, and that at present affairs are in the hands of M. J. Bannon, who is handling them to his own ends. The suit seeks, besides the appointment of a receiver, an injunction to prevent M. J. Bannon from voting 250 shares of stock which he claims to own, but which the plaintiffs aver belong to the estate of Pat Bannon, Sr. A mandamus is also asked to force M. J. Bannon, as vice-president, to hold an election of officers to manage the company.

It is recited that the company was the enterprise of Pat Bannon, Sr., and that when he had incorporated it in 1903, he distributed the stock among his children and grandchildren, reserving 650 shares of stock for himself. M. J. Bannon received 200 shares and now claims to have received from his father 250 shares more before the death of the elder Bannon. The plaintiffs claim that these 250 shares were never conveyed to M. J. Bannon, and that he holds it wrongfully, and should return it to the estate. It is claimed that though the charter provides for an annual election, there has never been an election since the first one in 1903, and the officers are holding over by expired commissions. It is also alleged that M. J. Bannon had entire domination over his father during the latter days of his life, and used it for his own purposes.

THE LITTLE GIANT GAS AND GASOLINE ENGINE.

The above is the title of the latest catalogue being sent out by the New Era Gas Engine Co., Dayton, Ohio. This firm is exclusive manufacturers of gas and gasoline engines and know their business much better than firms that make gas engines only as a side line.

The Little Giant engine can be put to numberless uses and is made only in from 1 to 20 horse power sizes. The 5 horse-power size, being the most popular.

If you have any use for an engine of this kind, do not fail to write to this firm first and get both their Little Giant and New Era prices, the later engine is made up to 125 horse-power.

Do not fail to mention THE CLAY RECORD when you write to them.

YORK BRICK MAKING CONCERNS PROSPEROUS.

According to York, Pa., brick manufacturers, the season now on promises to be the most active in the history of brickmaking in this city. The firm of Benjamin Kissinger's Sons is filling a contract for two and one-half millions of building bricks for the Fiske Company of New York City. It is now said that the Springgarden Brick Manufacturing Company also has an order for one million brick and that C. E. Miller is supplying a big order for the same materials. All the brick manufacturers are, it is said, filled with orders and are working full time. All the common brick manufacturers in this city have combined to form what is known as the York Brick Manufacturers' Association, whose capacity is from fifteen to eighteen millions of brick per year, and it is believed that their capacity will be utilized this season.

The prediction is also made that York will require a large number of brick. A member of the association said: "York is not going to be behind in the building business this year. There will be a great deal of building—more so, perhaps, than last year. All this in spite of the fact that there has been an increase in the prices of building brick, which went into effect on January 1. The rate of fifty cents per thousand additional for delivery in West York borough, has been abolished and brick can be delivered there for the same price as in the city proper."

STARTS CITY BRICK PLANT.

Frank Reich has taken out a building permit for 14 one-story buildings of brick structure, costing \$41,600, at Detroit, Mich. This means Contractor Reich intends to go ahead with the building of the municipal brick plant, and take chances on the courts preventing him getting his pay.

An injunction was issued by the Circuit Court temporarily restraining Controller Blades paying Reich any more money on the plant, but not restraining him from building the structure. Reich has secured only \$500 for his investment.

It is believed Commissioner Haarer hatched some scheme whereby Reich has been convinced that he will be reimbursed for the building of the plant.

MOB OF 300 WITH REVOLVERS AND CLUBS DRIVE WORKMEN FROM PLANT OF BRICK AND TILE COMPANY.

A mob of 300 strikers with clubs and revolvers swooped down on the plant of the American Enamelled Brick and Tile Company at South River, N. J., and drove before them 90 men who were at work. The men had refused to join in a sympathetic strike. The mob was made up of the employes of the Lyle Conduit Company, who have been out on strike several days.

The day before the strikers forced the men out of the Pyrongranite company's works adjoining the Lyle company's works. More calls for protection were made upon Sheriff Church by the manufacturers of South River, and thirty more deputy sheriffs were sworn in, making a total of 110 deputies guarding the plants of the brick and tile companies at South River.

Supt. Jacquart of the American Enamelled Brick company says that the employes of that company are satisfied with their wages and do not want to strike. The strikers are all foreigners.

FIRE BRICK MERGER IS BEING CLOSED UP.

Representatives of the largest independent fire brick interests in the country have been in Pittsburg during the past few days to arrange for the consolidation of their interests. It is expected that all contracts to the mutual agreement will be signed up not later than Saturday. Appraisers will start out about April 16. Manufacturers representing a daily output of 1,600,000 brick will be included in the merger. The capitalization has not yet been fixed.

Among the important concerns which have signed contracts to join the merger is the Joseph Soisson Fire Brick Company, of Connellsville, one of the oldest concerns in the trade, which has a daily output of 100,000 brick. The Savage Fire Brick Company, with plants at Johnstown, Hyndman, Williams and Keystone, has also signed up, as has the Reese-Hammond Company, whose plants have a united capacity of 250,000 bricks daily. The Dunbar Fire Brick Company and other interests in Pennsylvania, Maryland, West Virginia, Ohio and Kentucky, representing ninety per cent of the independent manufacturers, have expressed their willingness to consolidate. The new corporation will be independent of the Harbison-Walker Company, but will act in harmony with that corporation in sustaining good trade conditions.

Attorney A. M. Neeper, who was active in consolidating the coal and the two big brewery mergers, is general counsel for the new corporation. This new concern will establish headquarters in Pittsburg shortly.

The Milharking Contracting and Supply Company, of Newark, N. J., are installing the latest improved "Martin" Style "A" Steam Power Brick Machine, fit up in combination with Horizontal Pug Mill, and including sander, etc., at their plant at Florida, New York, this equipment being purchased from the Henry Martin Brick Machine Manufacturing Co., Lancaster, Pa.

SAND OR LIME BRICK OR BLOCK NEWS.

The Empire Brick Co., Glens Falls, N. Y., composed of business men, will be incorporated with \$25,000 capital.

William B. Withers, Gulfport, Miss., wants to correspond with manufacturers of machinery and supplies for making sand lime brick.

F. B. Stuart is a leader in promoting a sand-lime brick plant for El Paso, Texas. They will construct a plant under the Schwarz system.

J. F. Hicks, 309 Perry Avenue, Greenville, S. C., will establish a plant for the manufacture of sand lime brick and blocks. \$10,000 will be invested.

The United States Brick Corporation, Michigan City, Ind., will install another large drying cylinder, also another press, thus doubling the capacity of the plant.

The Sandstone Brick Company's plant at Ripley, owned by Houghton, Michigan, parties, is being enlarged and improved. Last year the company could not keep up with the orders.

The Universal Cement Brick and Block Co. has been incorporated in New York, with \$20,000 capital stock, by Thomas J. Byrne, William E. Walsh and Anna Walsh, all of New York City.

The Hiawatha (Kansas) Composite Pressed Brick Company has been organized with \$5,000 capital stock. The officers are E. E. Sherwood, president; A. Schreck, vice president; J. A. Jonas, secretary.

George Jamison & John Henley, Devils Lake, N. Dak., have purchased a complete line of machinery for the manufacture of cement brick and will build the factory on Mr. Jamison's land, adjoining the town.

The Northwest Front and Ornamental Brick Co., Second avenue and Perry street, Spokane, Wash., have commenced the manufacture of cement brick in their new \$30,000 plant. G. L. Wolfe is manager.

The Grattinger (Iowa) Tile and Cement Block Co. has been incorporated with \$10,000 capital stock. The officers are: H. G. Harrison, president; E. A. Baumgartner, vice president; Fred Spies, secretary, and Chris Jensen, treasurer.

The Lehigh Granite Brick Co., Allentown, Pa., has bought land on Furnace and Brick streets, and the plant will be put in operation some time this month. Robert F. Wentz is vice president and manager, and the office is at 701 Allentown National Bank Building.

The large sand-lime brick plant of the Hummelstown (Pa.) Brownstone Quarries Co., at Waltonville, which burned to the ground last November, will be rebuilt, a large force of men are cleaning up the site, and it is expected to save considerable of the machinery.

The Sand Cement Brick Co., Glens Falls, N. Y., has been incorporated with \$30,000 capital stock. The officers are: Lemon Thompson, president; Daniel L. Rogers, vice president, and Charles E. Bullard, secretary and treasurer. The factory will be erected at once at Shermantown. Twenty thousand brick will be made daily.

MISCELLANEOUS ITEMS.

Plans have been drawn and accepted for the Princeton (Ind.) Corrugated Sewer Pipe Works.

Bobzin & Co. have completed arrangements for the erection of a brick and tile works at Kellogg, Ia.

The Amite (La.) Brick Yard Co.'s plant has been sold for \$8,000 to the Amite City Bank and Trust Co.

Do you know that brick creep better on steel when drying than on any other material. See page 45 of this issue.

The Parry Manufacturing Co., Perryopolis, Pa., expect to commence work on their new brick works just as soon as the weather will permit.

The Ludowici Roofing Tile Co., Chicago, has changed its name to the Ludowici-Celedon Company and increased the capital stock from \$175,000 to \$1,000,000.

The Springfield Clay Manufacturing Co., Sugar Grove, O., has started under new management. C. F. Burman will be the manager and Charles Smith superintendent.

The Gessel Pressed Brick Co., Logan, Utah, has been incorporated with \$40,000 capital stock. Gottlieb Gessel, Jr., is president; Carl Gessel, secretary and treasurer.

The Success Brick and Tile Co., Greenwood, Miss., has been incorporated with \$30,000 capital stock. Incorporators are, R. F. Friermood, Frank H. Reid and W. M. Hammer.

J. R. Poupore, county treasurer at Grand Forks, N. D., has decided to manufacture brick on the Taylor farm, north of the city. He will put in a plant with modern machinery throughout.

The Waynesburg Brick and Stone Co., Waynesburg, Pa., has been incorporated with \$25,000 capital stock by A. L. Moredock, J. B. Ross, Thomas I. Barnes, S. C. Adamson and Frank B. Hill.

The Festus Pressed Brick Co., Festus, Mo., has been incorporated with \$15,000 capital stock. Incorporators are, Charles E. Miller, Robert F. Berry, Frank W. Brickley, Frank J. Sewald and others.

Brigham Bros. have purchased 800 feet of dock property at East Kingston, N. Y., and will increase their annual output of brick to 140,000,000 brick. Clarence Hendricks has also added another machine to his yard.

The Montgomery Brick Co., Christiansburg, Va., has been incorporated with \$20,000 capital stock by L. S. Randolph, president, Blacksburg, Va.; J. W. Piepper, secretary; E. S. Hagin, treasurer, both from Christiansburg.

The F. H. Goss Brick Co., Tacoma, Wash., has been incorporated with \$25,000 capital stock by F. H. Goss, W. R. Rust and L. J. W. Jones. The company has bought the Overton Pressed Brick Works on the water front. They will put in a modern plant.

The Brick Manufacturing and Construction Co., Franklin, La., has been incorporated with \$10,000 capital stock. An up to date brick yard has already been put into operation. The officers are S. H. Burris, president; H. B. Magee, vice president; C. Murphy, general manager, and J. K. Johnson, secretary and treasurer.

The Chicaska Brick Co., Chicaska, I. T., has installed a brick plant with a 30,000 brick daily capacity.

The Atkinson Brick Works, Wilmington, N. C., has been incorporated with \$25,000 capital stock by E. R. Strunk and others.

Mr. Jacob Pontz of Lancaster, Pa., is putting in the "Martin" Patented Dryers and Delivery System of 20,000 capacity.

The plant of the Ames tile works at Minonk, Ill., which cost many thousand dollars, has been sold for junk and is being dismantled.

The S. D. Corey Brick Co., Coxsackie, N. Y., has been incorporated with \$35,000 capital stock and will build a steam dried brick plant.

The Red Brick Co., Durham, N. C., has been incorporated with \$25,000 capital stock by N. Underwood, E. J. Parrish and C. A. Owens, all of Dunham.

The Steelton and Harrisburg Brick Co., Steelton, Pa., are installing the "Martin" Patented System of handling and drying soft mud brick of 35,000 capacity.

The Liberal (Mo.) Brick and Tile Co. has been incorporated with \$15,000 capital stock. Incorporators are: James Gwynn, George Meller and J. H. Levery.

The Choctaw Brick and Gas Co., Mansfield, Ark., has brought in the seventh well, this one flowing 3,000,000 feet. It will be connected with the brick works, three miles distant.

Joseph Kohl has bought the interests of S. W. Sparlin and Jas. Gass in the Barron and Weyerhaeuser, Wis., brick plants and will operate them with John F. Kohl and Frank Hulbert.

J. S. Klinefelter, Oxford and McKinley streets, Alliance, Ohio, wants to correspond with brick machinery manufacturers, with the purpose of establishing a 100,000 capacity brick plant.

The Humboldt (Neb.) Brick Co. has been incorporated with \$50,000 capital stock. Incorporators are: J. Holman, C. L. Holman, C. M. Linn, O. L. Bantz, A. V. Turner and S. E. Boyd.

The brick works on Fort Folly are to be reopened under the control of a proposed company named the Dorchester (N. B.) Stone and Brick Works Co., Ltd., and will be operated at full capacity.

The Harper Brick and Tile Co., Washington Street, Seattle, Wash., are making extensive improvements to their plant at Harper. New kilns and a drying system are being added. F. C. Harper is manager.

Brooksrae Brick Co., Pasadena, N. J., has been incorporated with \$125,000 capital stock to take over the Adams Clay Mining Co. Incorporators are: Henry E. Hillier, Henry J. Klos, Frederick R. Reeves.

The Virginia Clay and Material Co., of Virginia, has been incorporated at Dover, Del., with \$125,000 capital stock. The incorporators are: George S. Matchett and M. E. Hamer, of Philadelphia, Edwin R. Cochran Jr. and Judge Cochran of Wilmington, Del.

A tile factory is to be built at Ullin, Ill.

The new brick plant at Beaver Dam, Ky., will soon be completed.

M. H. Hyman, M. E., 4117 Vincennes Avenue, Chicago, Ill., is in the market for brickmaking machinery.

Edward Miner of Lewistown, Ill., has purchased an interest in a brick yard at Astoria and will operate same.

The Albuquerque (N. M.) Pressed Brick and Tile Co. is putting in a complete equipment of Fernholtz Brick Machinery.

Charles Smith has purchased a suitable site for a brick works at Greenoch, Pa., and is now forming a company to erect a plant.

Charles Vail contemplates putting in a pressed brick plant at Colby, Kansas, this spring. Samples of the clay have been made into brick.

The McNally Brick Co., Union, S. C., has been incorporated with \$5,000 capital stock by R. I. McNally, T. E. Bailey and J. E. Hancock.

The plant of the Standard Clay Co., at North Industry, Ohio, owned by Canton people, is to be opened up with Frank A. Downs as general manager.

The Auburn (Pa.) Shale Brick Co., has been incorporated with \$100,000 capital stock. The company has operated a plant for years under a New Jersey charter.

The Norton Brick Co., York Village, Maine, has been incorporated with \$100,000 capital stock. President and treasurer, J. C. Stewart; clerk, J. P. Putnam.

A new Thew Automatic Steam Shovel has been placed in the Nelson Brick's Co.'s plant at Mound Valley, Kansas. It handles enough shale to make 100,000 brick daily.

W. C. Calhoun, Waterville, Wash., has received his machinery for his new brick plant and will start on a contract to supply 1,000,000 brick for the Douglas County courthouse.

The R. H. Gerberding Co., object to manufacture brick and tile has been incorporated with \$45,000 capital stock at Camden, N. J., by R. H. Gerberding, Samuel Kaufman and W. B. Scott.

The Lenoir (N. C.) Brick and Tile Co. has been incorporated with \$25,000 capital stock. Machinery has been purchased. J. P. Spencer is president. T. P. Kincaid secretary and treasurer.

Robert E. Pray has bought the Elm Street Brick Yard of the New England Brick Company at Greenfield, Mass., and will manufacture brick soon as the season opens. He has installed an electric motor for power purposes.

The Wepusec Brick Co., of Wepusec Inlet, Thurston Co., Wash., has been incorporated with \$50,000 capital stock by George L. Walker, Bessie L. Savage, W. A. Foster, F. R. McLaren and A. W. Porter; office at Seattle.

A big brick yard is to be erected at Homestead, North Bergen County, N. J., by Frank Hall of Hall, Jagels & Ballis, a coal firm. The plant will be on the Paterson Plank Road, 300 feet from the Homestead Railway crossing. 25 feet of fine clay has been found.

CLAY RECORD.

CLAY LAND FOR SALE.

74 acres. Samples, pavers and sewer pipe, made from this clay, shows in all official tests equal to the standard pavers. Bed located on railroad and Erie canal, seven miles from Syracuse, N. Y. This city is to spend over a million dollars in sewerage. Property is sold on guarantee to make a No. 1 paver and sewer pipe. Terms easy.

HENRY LOFTIE,
216 Burnett Ave., Syracuse, N. Y.

FOR SALE.

An interest in my tile and brick plant, to one of experience, that can take charge and run it. Must be able to invest some money in plant. Plenty of good clay at back door, and good market at front door. This is an opportunity that you don't often run up against. Plant now running. Come and see or write

S. H. RECORD,
Charleston, Ill.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

Profitable running brick plant, 25,000 capacity. Ready sale for entire product. Owner has larger interests requiring attention.

TERRA HAUTE PRESSED BRICK CO.
Terra Haute, Ind.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address
T, care Clay Record,
Chicago, Ill.

BRICK YARD FOR SALE IN GAS BELT.

A fine brick yard for sale. Dry Press. Everything new last year. Five up-draft kilns. Making money. Fine shale bank. Can make brick cheaper than any yard in Kansas. Reason for selling one of the partners has large oil interests in Indian Territory. Will give time on part of price Making 30,000 brick daily and ready sale. Address

A. B., care Clay Record,
Chicago, Ill.

FOR SALE.

A second-hand Four-Mold Dry Press. Has not been used more than a year. Good condition of repair guaranteed. Also good second-hand 44-inch Pulverizer. Address

BOSTON,
Care Clay Record, Chicago, Ill.

POSITION WANTED.

Wanted, position as foreman or manager of a Dry Press Brick Plant of not less than 20,000 brick per day. A number of years experience. Address

ELLIS,
Care Clay Record, Chicago, Ill.

FOR SALE.

Chambers End Cut Brick Machine, capacity 3,500 brick daily. 75 double deck roller bearing stiff mud brick cars.

STRELTON & HARRISBURG BRICK CO.
Steelton, Pa.

PARTNER WANTED.

A good, reliable man of experience, with some capital to invest in and take charge of a new Dry Press Brick Plant. Plenty of shale, and good market for all the brick. Address

DENIS, care Clay Record,
Chicago, Ill.

WANTED.

A man who understands brick making in all its branches, and who has \$5,000 to \$10,000 to buy an interest in a large brick plant in the West, and take complete charge of same at a good salary. Plenty of business at good prices; no competition. Owner has other business and wants some one interested who can run the plant. Address,
"West," Care Clay Record, Chicago.

Machinery For Sale.

FOR SALE.

50 rack cars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.

Both styles of cars in first-class repair.
ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address
"GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.

THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new. DEALER,
Care Clay Record, Chicago, Ill.

FOR SALE.

A Two-Mold Boyd Dry Press, in excellent condition, having been used but very little. Will sell cheap. Address

G. PAULL ALEXANDER,
Canton, Ohio.

FOR SALE.

A brick and Tile plant, equipped with up-to-date machinery, 60,000 daily capacity, down draft kilns, inexhaustible bed of best clay suitable for all kinds of building, facing and paving brick, drain tile, sewer pipe, etc., on two railroads, demand very good. Address

B, care of Clay Record.

FOR SALE.

A going, money-making hollow block plant. Best location in Ohio. Also well equipped for face, common, paving and common brick. Includes coal mine and 125 acres of four foot Cambridge coal, overlaid with shale and underlaid with fire clay. Good prices and more orders than can be filled. Plant comparatively new and in excellent condition. Will be sold at \$40,000, two-thirds original cost, one-half cash and one-half credit. Good reason for selling. Address,

THE GUERNSEY BRICK & CONTRUCTION CO.
Cambridge, Ohio.

FOR SALE.

2,000 ft. 12-lb. steel rails, used one season. 11,000 32-lb. x 9½-in. No. 1 White Pine Pallets. One set Brick Moulds, new, 9 x 4¼ x 2½ inches. One 48-lb. Leviathan Belt for Potts' Sander, new. One Potts' Dump Table, used one season. RIVERSIDE BRICK CO.
Green Bay, Wis.

FOR SALE OR TRADE.

One Standard Brick Machine, steam power, 300,000 capacity. 24 new Brick Moulds. 11,000 Pallets. Three Off-Bearing Trucks. All in first-class condition. Owner, E. J. SWARTZ & SON,
Syracuse, N. Y.

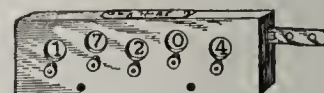
FOR SALE.

One Model "B" Four-Mould Dry Press, used only a short time, thoroughly overhauled.
Model B, care Clay Record, Chicago.

PERFORATED METALS

for all purposes
Prompt shipment of all orders guaranteed.

H. S. SIMPSON,
817 Chamber of Commerce
Chicago, Ill.



Paper Joggers quoted.

R. A. HART, 41 White St., BATTLE CREEK, MICH

No better made, cut from \$8 and \$10, to

4 Wheel, \$3.00

5 Wheel, \$3.25

Guaranteed.

Sold by all dealers

FOR SALE CHEAP.

First-class brick and tile plant. Good machinery. unlimited clay supply, 25,000 capacity daily, 3 kilns 170,000 capacity, dry sheds, etc. Track connections, A snap if taken at once. Address

H. O. MODLIN, Secretary,
Perry, Iowa.

ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

FIRE CLAY LANDS.

500 acres underlaid with heavy vein superior fire clay and light vein coal, which can be mined cheaply, on the line of the N. Y. C. & H. R. R. R., in Pennsylvania, for lease on royalty at low price per ton. For further information address the owner.
BOX No. 308, Williamsport, Pa.

FOR SALE OR EXCHANGE.

One of the best small brick and tile plants in Southern Michigan. 20,009 capacity, Stewart patent kilns, good drying sheds, all machinery in first-class condition, fine clay, good market. Will sell at a bargain or will exchange for good real estate. Address,

MICHIGAN,
Care Clay Record, Chicago

STEAM SHOVEL FOR SALE.

Barnhart style "B," good condition, large enough to dig clay for 100,000 brick in 8 hours. Apply to
ILLINOIS BRICK COMPANY,
918 Chamber of Commerce,
Chicago.

FOR SALE.

One 5-ft. Style American Dry Pan, practically new. One 10-bp. Gasoline Engine, complete.

KIAMENSI CLAY CO.
Newport, Del.

9-FT. DRY PAN WANTED.

We could use another Dry Pan and will buy at once if good and cheap. Will buy 25,000 capacity Stiff Mud Machine and Pug Mill and Dunlop Screen.

GOETZ PRESSED BRICK CO.
New Albany, Ind.

SETTER WANTED.

A first-class brick setter. State age, experience, reference and salary expected.
Box M, Neshkoro, Wis.

SAND LIME PLANT.

Huennekes System Plant, including best Four-Mould Boyd Press, Jeffrey Sand Dryer and Conveyor; all practically new and in good condition; will be sold at less than half of construction cost. Address, SAGINAW PRESSED BRICK CO.
Saginaw, Mich.

FRANK TOOMEY

127 and 131 North Third Street.
PHILADELPHIA, PA.

Great	Assortment,	3,200	Pieces.	ENGINES,	CORLISS.	Automatic,	Steam	Slide Valve,	Pumps,	Dynamos,	General	Machinery of	all kinds	Rebuilt and	Guaranteed.	Immediate	Delivery.	Send for	List of Stock
-------	-------------	-------	---------	----------	----------	------------	-------	--------------	--------	----------	---------	--------------	-----------	-------------	-------------	-----------	-----------	----------	---------------

Brick and Mortar Coloring

After twenty years "Clinton" colors still stand at the head. Get the genuine, with the "Little Yellow Side-Label."

CLINTON METALLIC PAINT CO., Clinton, N. Y.
CORRESPONDENCE SOLICITED.

WARNING

NOTICE is hereby given that the process of drying and burning brick by first setting green, undried brick in horizontal courses in a kiln to form a layer thereof, then covering and drying such layer, and successively coursing, capping and drying separate layers of green, undried brick upon the last dried layer until all the layers are thoroughly dried, and then burning, is patented in U. S. Letter Patent No. 485199 to J. C. Kenzel, dated Nov. 1, 1892, and all persons are hereby warned against using such processes without grant or license from the undersigned owners of said patent. Unauthorized use of the patented process will render the user liable to an action for infringement and the payment of damages to the owners of the patent, whose rights thereunder will be strictly enforced.

J. C. KENZEL,
J. S. KRAUSS,

P. O. Box 271.

128 Logan St., Knoxville, Tenn.

The Burlington Route

calls attention to manufacturers seeking a new location to its Industrial Department. This department is established for the benefit of manufacturers. Information on the three Rs of manufacturing—Power, Raw Material, Market—can be had by writing



W. H. MANSS,

Industrial Commissioner,

209 Adams St., CHICAGO.

CLAY RECORD IS A SEMI-MONTHLY

NOW READY—A TREATISE ON

PRODUCER-GAS and GAS-PRODUCERS

BY AN ACKNOWLEDGED AUTHORITY.

A 300-page book containing thirty chapters, giving the fundamental principles and definitions, calculations, classifications, manufacture and use; the fuel, the requirements, the history, its by-products, **Producer-Gas for firing kilns, steam boilers, and power plants.** The future of the Gas-producer and a bibliography.

OVER 100 CHOICE ILLUSTRATIONS—PRICE, \$4.00.

A subscription to the CLAY RECORD for one year without additional charge to those that are not now subscribers.

CLAY RECORD PUBLISHING COMPANY
CHICAGO, ILL.

Refractory Cement

(So called because it is worked the same as cement)

A high refractory composition that can be used the same as cement, cured and put to use in twelve to twenty-four hours, and will endure any degree of heat that fire-clay products will.

Applied to the inside of a kiln it will protect the walls and give increased refractivity; will reduce the cost of repair, and save fuel in any kiln.

Every boiler furnace should be lined inside with "Refractory Concrete." It will protect the walls and increase the heating capacity by preventing radiation.

For insulating steam pipes this composition is guaranteed equal to asbestos or magnesia felt; the cost per foot to cover a 3-inch to the thickness of 1 inch will be 4c.

Refractory brick of a high order can be formed from the composition on any cement brick machine.

For flue linings, chimney blocks and tops, floor and partition blocks, conduits for electric wires, etc., this is the ideal material.

Refractory Concrete can be combined with any aggregate used in the formation of cement products.

For information pertaining to your particular requirement, and prices, address.

E. R. STOWELL

NEW CORYDON, INDIANA

**A NEW CLAY FEEDER AND MIXER**

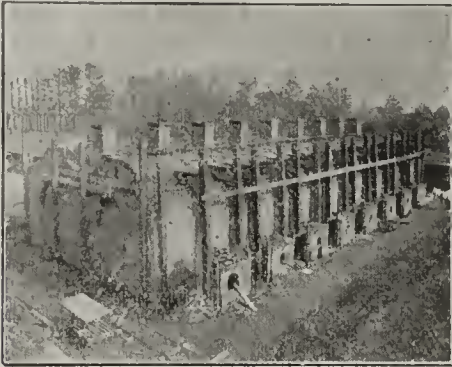
The Rust Clay Feeder has been brought out in response to a better method for mixing and feeding clay in brick, tile and all clay working plants. By the use of this feeder the services of two men are entirely dispensed with, the clay being dumped into hopper of machine from car is automatically fed into the disintegrator. The spirals draw their supply evenly from all parts of the hopper, mixing the clay perfectly, which tends both to improve and increase the output of the plant.

Send for full descriptive circular.

Marion Machine, Foundry and Supply Co.

Marion, Ind.

Something New In Brick Kilns and Dryers



The Dennis Double Chamber Up and Down Draft Brick Kilns and Direct Heat and Hot Air Brick Dryers show many new features that make them superior to all others. Economical, durable and strong in construction and operation, having many points of advantage that appeal to practical brick makers. Patented April 14, 1903 and September 8, 1908. Brick plants installed and put in operation. Write for booklet. Correspondence solicited.

F. W. DENNIS,
145 Water St., Norfolk, Va.

Absolutely safe and reliable. Ask your friend

A WOODEN TOWER

Is a source of annoyance and danger. It is liable to rot and collapse at any time. A

CALDWELL STEEL TOWER

is safe, staunch and durable and will carry four times the weight of the filled tank. Expensive labor is not necessary to erect these outfits, your own men can do it. We furnish all plans.

Send for illustrated catalogue and price list.

W. E. CALDWELL CO., - Louisville, Ky.

Robert F. Wentz, M. W. S. E.

701 National Bank Building, Allentown, Pa.

DESIGNER AND BUILDER OF

Cement and Sand-Lime Brick Plants, Analysis, Tests, Examinations, Reports, Preliminary Plans, Estimates and Complete Drawings and Specifications for Modern Cement and Sand Lime Brick Works.

We have designed, built and reconstructed twenty-two Cement Plants in the past twenty years.

We design and equip complete Cement and Sand-Lime Brick Plants with the most modern machinery.

THE HYDRO - MALAXATOR PROCESS for the manufacture of Sand-Lime Brick.

How to Use Portland Cement.

From the German of L. Golinelli.

Translated by Spencer B. Newberry, E. M., Ph. D.

A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.

22,000 copies sold in Germany.

Portland Cement Sidewalk Construction.

Compiled by P. B. Beery, and based upon the experience of many successful contractors.

A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.

FIRE! FIRE!! FIRE!!!

THE "CHILDS"
FIRE EXTINGUISHERS
APPROVED

and included in the list of approved extinguishers issued by the

National Fire Protection Association

SALESMEN WANTED

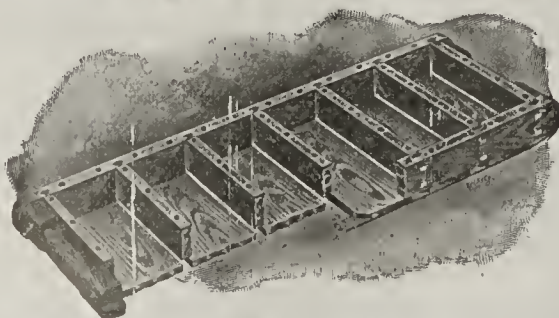
O. J. CHILDS CO.

Sole Mfrs.

UTICA, N. Y.



PERFECTION BRICK MOULDS



PATENTED JAN. 28, 1902.

THE ARNOLD-GREAGER CO.

Manufacturers of Brick Machinery
and Supplies of all Kinds.

NEW LONDON, OHIO.

These are the kind of Brick Moulds the Brick Makers have always wanted but could not get till now. You can get a mould that the vents are right all the time. No change whether the Mould is wet or dry. Try a sample order. Satisfaction guaranteed.

Brick Moulds and Brick Barrows

With Moulds and Barrows it is not the first cost, but it is, will they last? We have made them for over 30 years and know your wants. All kinds and shapes. A trial order will convince.

James B. Crowell & Son,
Wallkill, N. Y.

H. M. DEAVITT,
PRACTICAL AND CONSULTING CHEMIST,
Garden City Block,
CHICAGO.

Analyses of Clay, Sand, Lime, Cement Materials and Shales a specialty.

Special attention given to the preparation of Clay Products from the raw material.

A well equipped laboratory and long experience in this branch of work enables us to give expert reports on obtaining glazes on refractory materials.

All enquiries in regard to the above will receive prompt attention.

CLAY RECORD

Vol. XXVIII. No. 8.

CHICAGO, APRIL 30, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, 10 Cents

PRODUCER GAS AND GAS PRODUCERS.*†

BY SAMUEL S. WYER, COLUMBUS, OHIO.

Gaseous fuel has long been desideratum. Where nature has not made it, man has tried to manufacture it by some artificial means. Numerous processes for the gasification of solid fuels for heating purposes have been developed, but these have all fallen by the wayside, with the exception of the producer gas process.

In order to have a clear understanding of the producer gas process, it is necessary to have a clear understanding of certain fundamental conditions upon which the production of gas is based.

Gases may be divided into three groups: First, those consisting of one element, as oxygen gas, for instance; second, compound gases, where two or more elements enter into the composition, as marsh gas for instance; and third, mixtures where two or more elementary or compound gases are mixed together. Producer gas belongs to this group.

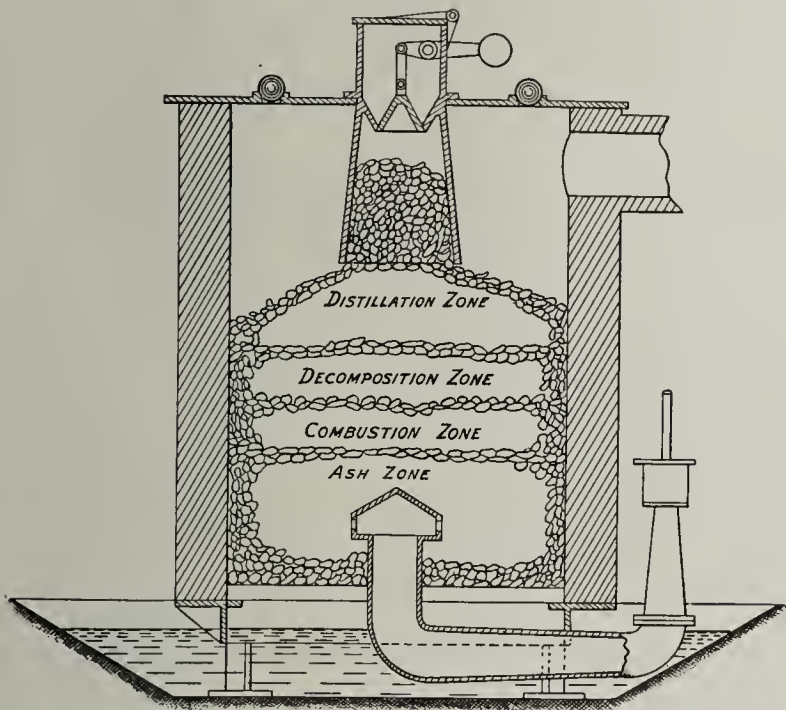


FIG. I.—Showing the Different Zones of Gas Producer.

The properties of producer gas will be dependent upon the properties of the raw fuel and the methods of manufacture. In as much as the properties of the mixed gas are to be determined by the constituents, a knowledge of those constituents is desirable.

*Delivered at the 28th annual meeting of the Illinois Clayworkers' Association, held at Champaign, Jan. 23-24-25, 1906.

†Illustrated by lantern slides.

Hydrogen when present in producer gas increases its calorific power and makes combustion much more rapid; for the latter reason the percentage of this element present in producer gas which is to be used in gas engines is limited. An excessive amount of hydrogen will give trouble in the engine. Marsh gas increases the calorific power of the gas in which it is used and retards the rate of combustion, it is therefore a very desirable constituent. Olefiant gas gives gas in which it is its illuminating properties.

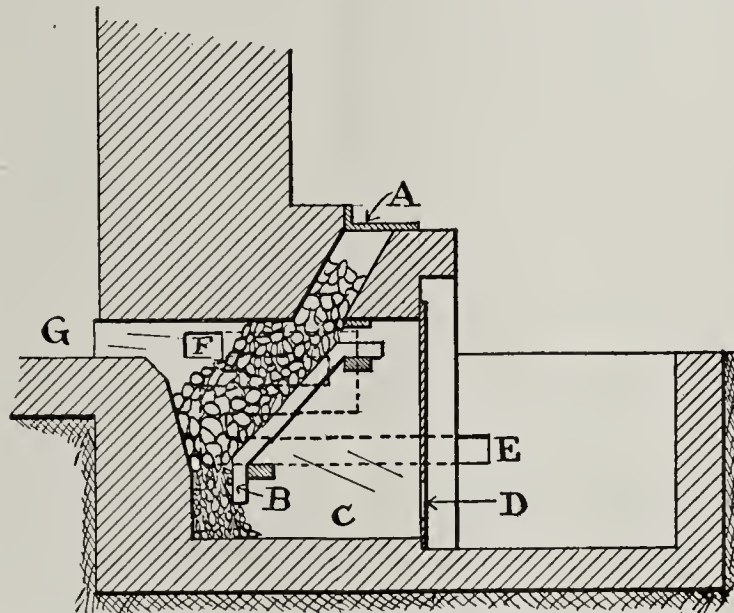


FIG. II.—Gas Producer forming a Part of a Kiln.

Carbon monoxide gas is combustible and is the principal combustible constituent of producer gas. Carbon dioxide gas is a diluent, and from this very fact that it represents a certain waste of fuel it is very undesirable. Oxygen and nitrogen are always present, and are merely diluents. Water vapor is usually present, and will cause a decrease in temperature when the gas is burned. In many cases, especially where gas has been made from fuels rich in hydro-carbons, the gas contains a large number of hydro-carbons.

For a further understanding of producer gas, it will be desirable to know the difference between the various other commercial gases with which it is sometimes associated, and itself.

Retort gas is made by the destruction or distillation of coal in externally heated retorts; a residue of coke is formed in the retort and this is a byproduct of the system. This is the gas that is frequently used for illuminating purposes. It is also known as "Town," "City," "Illuminating" and "Bench" gas. These terms are all inaccurate, since neither one of them is exclusive nor inclusive. By-product coke oven gas is the by-product from the coking of coal in a retort oven. It differs from retort gas in that the gas is the by-product and the coke is the main product.

Oil gas is made from the vapors of oil, usually by passing oil through highly heated tubes.

Water gas is produced by breaking up water or steam into hydrogen and carbon monoxide. This is done by bringing the water or steam into intimate contact with incandescent carbon. On account of the large amount of heat absorbed, the process is intermittent and hence is not adapted for a great deal of metallurgical work.

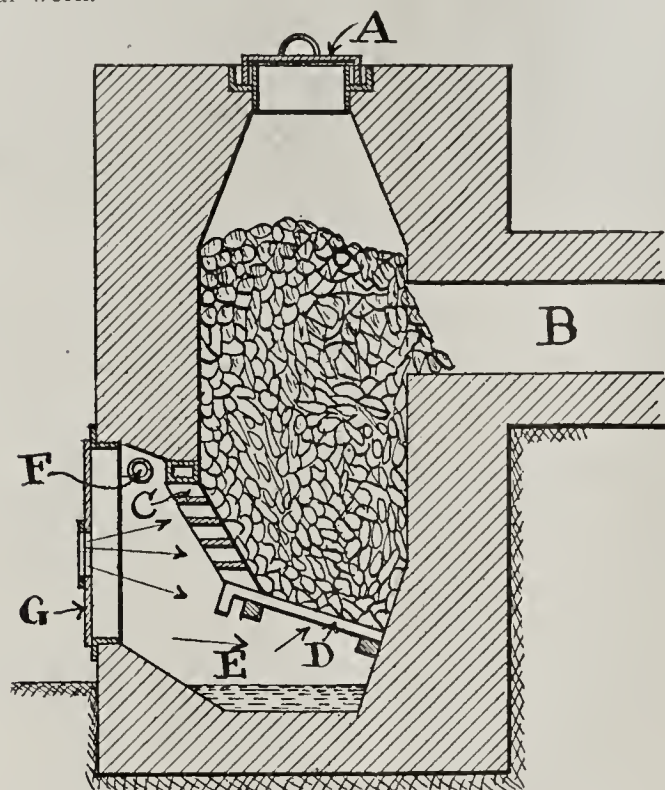


FIG. III.—Gas Producer, built as a Separate Structure.

Blast furnace gas is produced in the blast furnace in the manufacture of iron. Every blast furnace is a huge gas producer and for that reason the gas given off from the blast furnace is very closely related to producer gas.

Producer gas is made up of a plurality of constituents. The proportion of each present will depend upon the type of apparatus used in its manufacture and the nature of the raw fuel.

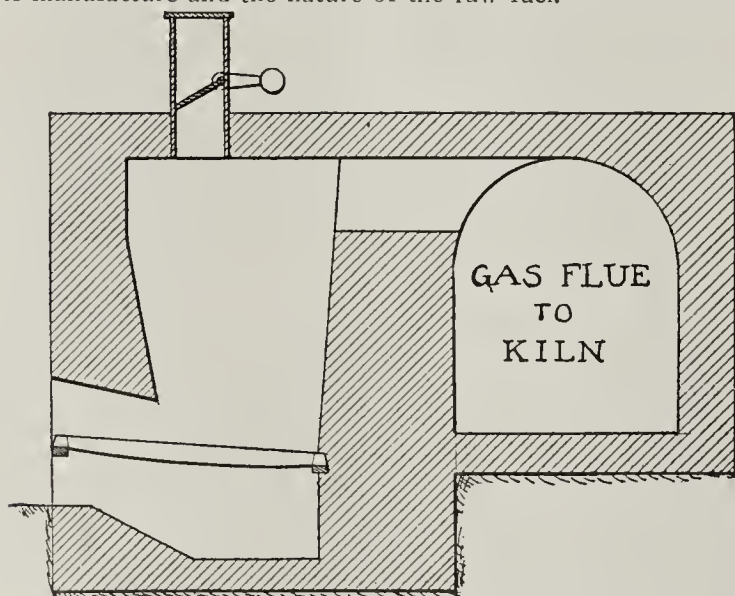


FIG. V.—French Design Gas Producer Continuous Kiln.

The heat required in the process of gasification is received from or rather is evolved by a partial combustion of the fuel itself. Direct firing and gas firing are frequently confused, and for that reason it is clear that a distinction is desirable. In direct firing the fuel-bed is so thin that you have practically complete combustion from the surface of the fuel-bed. In gas firing, the fuel-bed should be so thick as not to permit enough oxygen to get through to burn the gas completely and as a result of that you will have a combustible gas given off from the surface of the fuel.

The distinction is in the thickness—a thick fuel-bed for the gas fire and a thin one for the direct fire; that is the essential difference. The fires in some kiln fire boxes are so thick as to closely approach the condition of gas firing. Inasmuch that gas producers have been in use a number of years, it is not unnatural that several absurd terms have crept in. One of the most absurd terms in this connection is the application or rather the use of the name of the "Producer" with the gas itself. Such terms as "Loomis gas" and "Siemens gas" are absurd, just as it would be absurd to speak of steam made in a Stirling boiler as "Stirling steam." The gas made in the suction type of producer is frequently spoken of as "Suction gas." This is also erroneous. In just the same way, we could speak of the steam made in a water tube boiler as water "Tube steam."

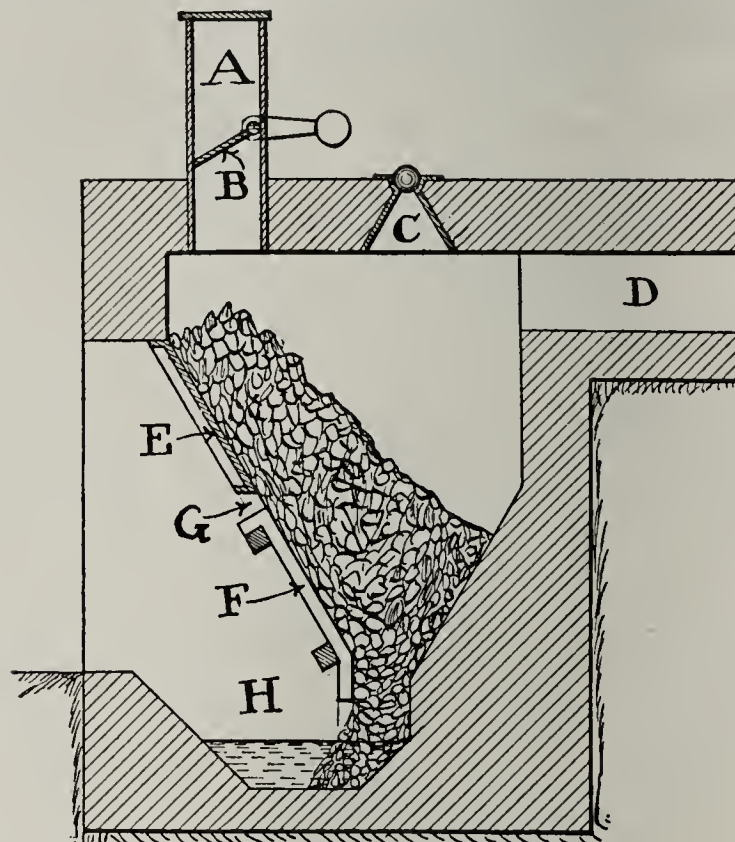


FIG. IV.—German Design Gas Producer for Kilns.

In these views about to be given illustrating the different forms and types of apparatus, I shall simply go into the detail of their construction.

CLASSIFICATION OF GAS PRODUCERS.

1. Method of operation:
 - (1) Externally heated retorts.
 - (2) Incomplete combustion with air.
 - (3) Incomplete combustion with air and steam.
 - (4) Water gas process.
2. Method of supporting fuel:
 - (1) Solid bottom.
 - (2) Water seal bottom.
 - (3) Bar bottom.
 - (4) Revolving grate.
3. Place of removing gas:
 - (1) Top.
 - (2) Middle.
 - (3) Bottom.
4. Means of agitating fuel:
 - (1) Hand poking.
 - (2) Mechanical poking.
 - (3) Revolving grate.
5. Direction of Blast:
 - (1) Upward.
 - (2) Lateral.
 - (3) Downward.
6. Nature of draft:
 - (1) Natural.
 - (2) Forced.
 - (3) Induced.
 - (a) By an exhaustor.
 - (b) By engine piston.

A gas producer is divided into four zones in about the proportion as in the illustration, Fig. I., showing zones of a Gas Producer. In practical the lines of the different zones are only imaginary.

In the lower, or Ash zone, mechanical action takes place. Its object is to keep the heat that is developed by the combustion of the fuel away from the grate, so that it will not burn out, otherwise it is of little importance with the exception of heating the air and steam before they go to the zone above. As the ashes accumulate the thickness of the fuel bed must be increased to make enough room for the combustion zone.

In the combustion zone the air and steam meet the carbon, the oxygen uniting with the carbon to form carbon dioxide, while the steam is superheated, and no doubt begins to decompose. The heat in this zone is about 2000 degrees Fahrenheit.

In the decomposition zone is where the carbon monoxide is generated; steam decomposed into hydrogen and the carbon dioxide reduced to carbon monoxide. In this zone a large amount of heat is absorbed to compensate for the carbonization of carbon dioxide, and the decomposition of the steam. In order that the reactions may take place, the heat in this zone is kept at about 1800 degrees Fahrenheit.

The Distillation zone occupies the upper part of the fire. The addition of the fresh fuel always lowers the temperature, which varies from 700 to 1300 degrees Fahrenheit, but the heat of lower zones distills the volatile constituents of the fresh fuel. The nature of the hydro-carbons will depend upon the temperature. If this is kept high, the hydro-carbons will be easily broken up, and the hydrogen liberated. This means lots of permanent gas and very little tar and soot. If the temperature is kept low, the hydro-carbons will be condensed easily and the amount of tar and soot will be greater.

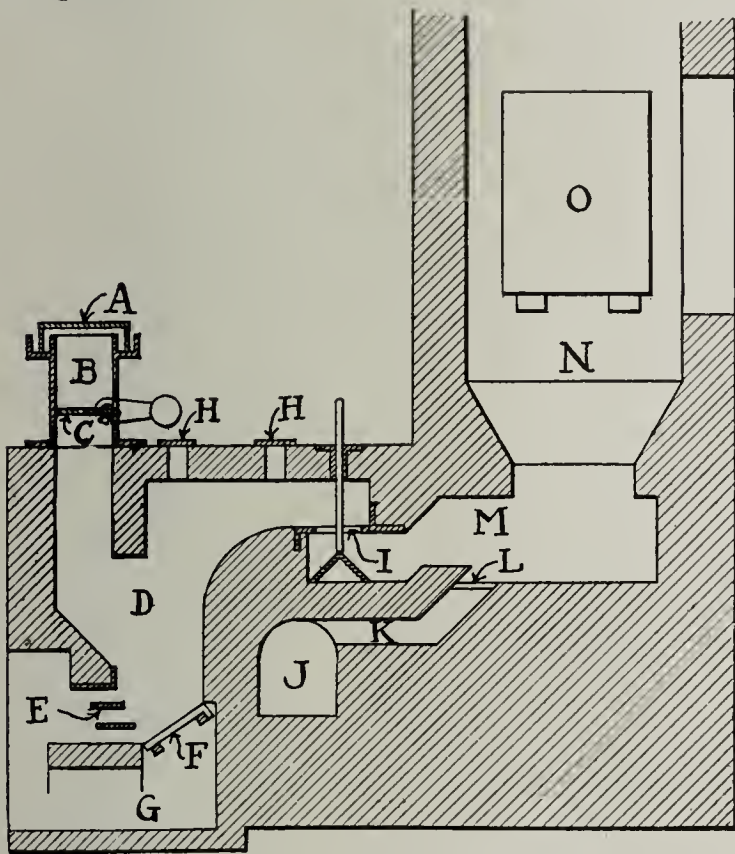


FIG. VI.—German Design for Muffle Kiln.

Gas Producer, Fig. II., is a part of the kiln. A is where it is fed the fuel; B is an inclined grate; C is the ash pit; D is where the air enters for the producer, and E where the air enters for the combustion of the gas. In passing through this duct, it becomes preheated and comes out at F and meets the hot gas from the producer, where combustion begins and it is carried out into G or the kiln.

Gas Producer, Fig. III., is built separate from a kiln. A shows where the fuel is put in; B is the gas flue (its combustion chamber in kiln); both C and D are grates. E is the ash pit, kept partly full of water; F and G supplies water to the pit.

Gas Producers, Fig. IV. and Fig. V., are about like the Siemens gas producers. A in Fig. IV. is the feeding hopper; B is a swinging valve; C is a poke hole; D is the flue to the combustion chamber of the kiln; E is a solid apron, and F is the grate, with G as a poke hole; H is the ash pit, partly filled with water. Fig. V. was used for firing a continuous brick kiln in France.

Gas Producer, Fig. VI., is a German design, which has been successfully used for heating a muffle pottery kiln. A, B and C are the lid, changing hopped and air-tight valve; D is the producer proper; E and F are the grates; G the ash pit, and H the inspection or peep holes. J is the main air duct, which leads to M and N, the combustion chambers through K and L; O is the muffle kiln. The gas from D comes through I and then meets the air from K L, divides the air into gas, which makes the gas burn with a smaller excess of air.

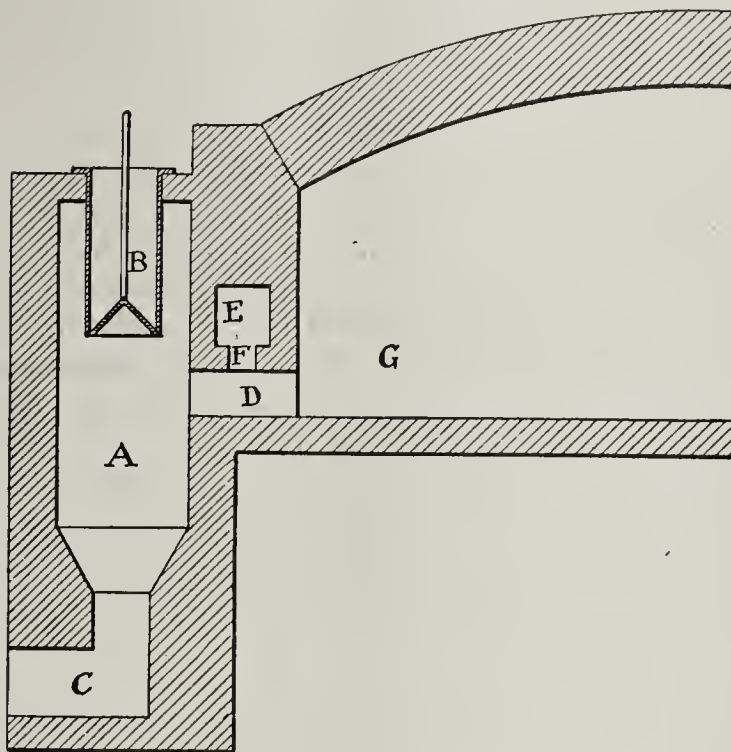


FIG. VII.—German Design for Continuous Brick Kiln.

Gas Producer, Fig. VII., is another German design, used in heating a continuous brick kiln. A is the body of the producer; B the feed hopper; C the ash pit. This producer has no grates, the fuel going to the bottom. D is the flue in which the gas reaches the combustion chamber G; E is the air duct, and H is its port-hole. The air for making gas of the fuel, comes in through the ash pit, and the air for the combustion of the gas enters at the main air duct and the port-hole.

BROOKLYN BUILDERS TO BUY BRICK DIRECT.

The great and steady increase in price of brick during the past seven years has led a very large number of the big builders of Brooklyn, N. Y., to form an association whose business will be to buy brick hot from the kilns.

To store the brick the association has secured a plot of land about a quarter of an acre in extent, bordering on Gowanus Canal.

The officers of the association are: J. Maguire, president; Charles G. Reynolds, treasurer; Otto Singer, secretary.

Most of the buildings in Brooklyn are built by speculative builders. The action of the association will seriously hurt the business profits of dealers in brick and divert them instead into the pockets of the members of the association. About seven years ago the price was \$7 a thousand. Now the price is \$15.

As the brick will be purchased direct by the combine and retailed only to members, who alone will be beneficiaries, the members expect their experiment will boom into a most prosperous business venture.

PROF. BAKER OF THE UNIVERSITY OF ILLINOIS TELLS HOW IMPROVEMENTS MAY BE MADE IN BRICK STREETS.

Good pavements, pavements that are worth every cent the property owners put into them, is the subject of growing importance. That methods of laying even brick streets may be improved until they are smooth and more durable has been demonstrated. Many modern ideas for the preservation and protection of brick streets have been advanced, but in Freeport few of them have been adopted.

Prof. I. O. Baker, of the University of Illinois, has contributed to the twentieth annual report of the Illinois Society of Engineers and Surveyors. The result of his study of joint fillers for brick pavements is complete. On this the report says:

"For the smaller towns or cities, brick pavements are preferred for several reasons: First, they are easy to construct and maintain. Second, their first cost is comparatively low. Third, they can be more easily repaired than asphalt in case the street is opened for gas, water or sewer pipes. Fourth, they are durable. For these reasons this kind of pavement will continue to be used for some time to come, and some expedients for their betterment will be considered. The extremely low price at which Portland cement can be obtained makes it more economical to use a Portland cement concrete than a rich natural cement. The former being about 10 per cent cheaper and 50 per cent stronger than the latter.

"The proper treatment for the joints of brick pavements is quite important, and yet it is a feature that does not receive the same amount of attention as the selection of the brick or the construction of the foundation. This neglect is probably due to the fact that it has been difficult to obtain a filler which will meet with all the requirements. The interstices between the bricks should be filled with a material: (1), to keep the brick in proper position; (2), to lessen the chipping of the corners and edges of the brick; (3), to prevent the water from entering the joints and penetrating to the foundation, and (4), to render the pavement as free from noises as possible.

"Sand was the best filler employed for brick pavements, and is now more extensively used for that purpose than any other material. The advantages of the sand filler are: (1), it is cheap, usually costing not more than 2 cents per square yard; (2), the pavement may be put into use as soon as the bricks are laid, and the cement in the foundation set so as not to be damaged by the rolling and traffic; (3), the pavement may be taken up easily to make any underground repairs without damaging the brick; (4), the pavement will be ironed out under the traffic, and will become smoother after it has been used for awhile than it was when it was first thrown open. The disadvantages are: (1), the sand does not protect the corners and edges of the brick and keep them from chipping; (2), it may be washed out on steep grades by the rains and by the flushing of the hydrants; (3), it may be removed from the top of the joints by the street sweeper or the pneumatic cleaner. In

the last two instances, the crevices become filled with droppings and other decaying matter, which is an objectionable feature; (4), the filler does not remain flush with the surface of the brick, causing the passing vehicles to jolt and rattle with considerable roar and noise.

"Next to the sand, in point of extent in use, is the Portland cement grout filler. It is prepared by making a thin mortar of neat cement, or one part of cement and one part of fine sand, the latter proportions being the more common. The mortar is swept into the interstices. Where this filler is used, expansion joints should be provided both transversely and longitudinally. The cost of 1 to 1 Portland cement filler will be from 8 to 12 cents per square yard, the higher price being paid where extraordinary care in mixing and applying was employed. The advantages of a cement filler when it is properly applied are: (1), it thoroughly protects the corners and edges of the brick; (2), it cannot be washed or swept out of the joints; (3), water cannot penetrate the pavement and reach the foundations; (4), it makes the pavement thoroughly sanitary; (5), it adds as much strength to the pavement as the ordinary concrete foundation. The objections to the cement filler are: (1), it causes the pavement to rumble when the vehicles are passing over it. The explanation for this rumbling is not satisfactorily explained, and the expansion joints do not entirely eliminate it; (2), it is very hard to tear up and repair the pavement, and the old brick are rendered almost useless; (3), after applying the filler the pavement should stand from seven to ten days before traffic is admitted. This causes considerable inconvenience to the occupant of the property, especially in a business district; (4), it prevents the large brick from being settled in the sand cushion by the traffic, thus making the tractive resistance on pavements with cement filler greater than that of a sand-filled pavement that has been used for a while; (5), considerable attention is required to see that the ingredients composing the filler are perfect and that it is properly applied.

"Another filler for brick pavements is a No. 4, No. 5 or a No. 6 coal tar distillate. No. 6 is the grade ordinarily used for this purpose. The tar is brought to the pavement in barrels, heated in kettles to a temperature of 300 to 320 degrees F., and poured into the joints from vessels with a small spout or from funnel-shaped cans. The cost of a tar filler is from 10 to 12 cents, depending on the locality of the pavement and the width of the joints. As long as this material remains in place, it keeps the brick in proper position, makes an impervious joint, and does not cause the pavement to rumble. The objectionable feature to the tar filler is that in the summer heat it melts and flows from the joints to the gutters, and there remains, making the pavement rough and hard to clean; and in the winter it becomes brittle, is chipped out of the joints by the horses' shoes, is ground into dust and swept or blown away. In both instances the crevices are filled with droppings and dirt which are very inferior to sand as a filler.

"Another filler, little used in the middle west until within the last year, which merits the attention of every city

engineer, every property owner whose street is about to be paved, and every brick maker, is manufactured from genuine asphalt by the American Asphaltum & Rubber Company. The requirements this product shall meet, as given out by the company, are as follows:

"The asphalt shall not be less than 99.5 per cent, pure bitumen composed of not less than 68.5 per cent petrolene, and 31.2 per cent asphaltene (each having a specific gravity of not less than 0.90 and 1.13 respectively.) The specific gravity of the compound shall not be less than 0.99. It shall not be 'tacky' after the exposure of five hours to a temperature of 125 degrees F. The melting point shall not be less than 210 degrees F., and by capillary tube tests it shall not commence to melt below 195 degrees F., and shall not run below 215 degrees F. The filler shall remain ductile at all ordinary temperatures, and shall not be affected by the moisture.

"The advantages of the asphalt filler are: (1), it keeps the brick in proper position; (2), it thoroughly protects the edges and corners of the brick; (3), it cannot be washed or swept out of the joints; (4), water cannot penetrate it and reach the foundation; (5), it is thoroughly sanitary; (6), it adds about half as much strength to the pavement as the ordinary concrete foundation; (7), it does not run in summer or become brittle in winter, and cannot be ground into dust, and at all times remains flush with the surface of the brick, and prevents the wheels of the passing vehicles from jolting and rattling over the joints with a rumbling and roar; (8), it takes care of the expansion of the brick, and there is no rumbling sound; (9), openings in the pavement can be more easily made and repaired than where a cement grout filler is used, and the asphalt can be removed from the brick with but little difficulty, be heated and used again in making repairs; (10), the pavement may be thrown open to traffic immediately after pouring the joints. On some streets the inconvenience caused by having the street blockaded for a week or ten days longer would amount to more than the additional cost of the filler.

"At Bay City, Mich., is a pavement having the interstices filled with asphalt. This work was completed in 1899, and on examination the asphalt seemed to have retained all of its original properties, and could be worked into a ball without crumbling to pieces. The cost of this is about 14 to 16 cents per square yard, which is about 12 to 14 cents more than sand, and 4 to 6 cents more than cement grout. If some expedient could be devised whereby a mixture of one part asphalt and one part sand could be poured and entirely fill the joints, excellent results could be obtained, and the cost would be very considerably reduced. But the extra expense of the asphalt filler is only a small item, and when its usefulness and the comforts which it affords are considered, the money is well invested.

"Where cement grout filler is used some expedient should be used to prevent the expansion caused by the rise of temperature, from heating the pavement or breaking off the curb where the sidewalks extend out to it. The rumbling

noise, so common with this filler, has been attributed to this temperature expansion. However, in instances where the pavements are provided with tar expansion joints, the rumbling is still present, and right at the joints. From this we must conclude that the rumbling is from some other cause or the material used in the expansion joints does not possess sufficient elasticity. It has been the common practice to use No. 4, No. 5 or No. 6 coal tar distillate in the expansion joints and with very excellent results."

BRICK ENTERPRISE IN COLUMBIA.

Consul Demers, reporting from Barranquilla, says that the sand-lime brick industry is being developed in that Colombian city by a European concern which has imported its machinery from Germany.

The present capacity of the plant is 6,000,000 brick per annum, and the selling price \$6 per 1,000. Under a twenty-year concession they operate on 150 acres of inexhaustible limestone and sand deposits which they purchased. The mixture of sand and lime is kneaded together under steam pressure in a powerful mixer, compressed into shape, run on cars into hardening cylinders, where the brick are kept for ten hours under 130 pounds steam pressure. The brick are the standard European size, 10 by 5 by 2½ inches. The company enjoys fine shipping facilities, the Barranquilla Railroad runs through their property, and the rate of freight to the port of Puerto Columbia (Savanilla), 18 miles distant, is 80 cents per ton. The proximity of this port to the Isthmus of Panama offers great facilities for obtaining these brick on the Canal Zone at, as the proprietors believe, a lower price than if imported from any other part of the world. Small crafts not drawing more than 10 feet of water can, at certain times of the year, enter the Magdalena River and load brick direct at the brickyard, which has extensive water front.

Barranquilla offers wonderful facilities for the manufacture of lime-sand brick, as the geological formation of the country for miles around the city limits, is of coral limestone covered with a stratum of sand to the depth of about 6 feet. Fuel is abundant, hard wood costing in big lots \$1 per ton, and plentiful and efficient labor, seemingly far superior to the Jamaican labor, is to be obtained at an average of 60 cents per day.

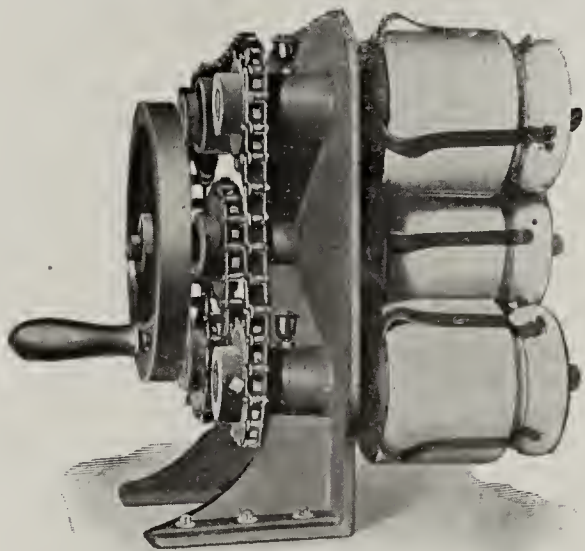
This firm also manufactures an extensive line of cement roofing tiles and flooring mosaics in fancy-colored patterns and imitation granite. The standard of this work seems to fairly rival foreign products. Besides, it produces about 20,000 tons of lime per annum, of which a large proportion is used in the manufacture of their brick, the balance being sold here at \$4.50 per ton, and extracts from quarries about 9,000 tons per annum of foundation stones, sold at \$1.20 per ton. Their cement, of which they are now using 5,000 barrels per annum, is imported from Germany and France, and costs them \$4 per barrel of 400 pounds placed here. Roman cement has been placed on the free list by a recent government decree. The cement used by the factory is of a special quick-setting quality, which is somewhat different from the average run of American hydraulic cement. It is to be regretted that the American manufacturers do not cater for this trade, in view of the fact that a large quantity of American cement could be placed with them to advantage, not mentioning the amount that could be placed also with other large cement importers of Columbia and the Canal Zone.

There are about 14 small clay brick yards in Barranquilla and vicinities, with an aggregate production of about 20,000 brick per day.

ABBE PEBBLE AND TUBE MILLS.

The above mentioned machines are the product of a firm that has made the subject of Pebble Mills in all styles and sizes its special study for a number of years with the result that they are today offering machines which are superior to all others, on account of the vast number of improvements that they have made on them and for which they have procured numerous patents in the United States and foreign countries.

It is not the intention to give a full description of all the machines built by this firm in this article as that would require many pages, but to show with a few illustrations the difference of several styles and the long range of sizes.



Copyright, 1905, by Abbe Engineering Co.

Sample Laboratory Mill.

The first cut shows a Sample Laboratory Mill with five (5) Porcelain Jars each of which is capable of handling from $\frac{1}{4}$ oz. to 2 lbs. at a time. This mill is used very extensively for grinding clays, coal, colors, etc. for analyzing purposes where only small quantities are tested at a time, but a large variety is treated during the day. This is the smallest machine of this kind in the world and is used quite extensively throughout the country. The United States Geological Survey being a user of several.

The Abbé Company build Pebble Mills in eight designs and more than twenty-five different sizes.

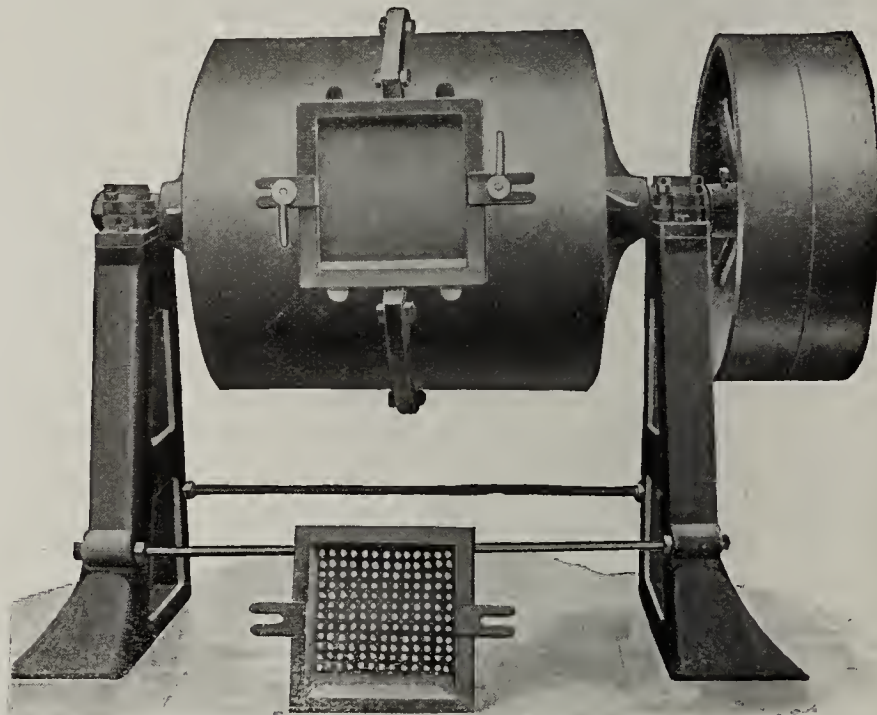
The next design is classed as Laboratory Mills which are built with either 1, 2, 4, 6 or 12 jars. These jars being all the same size and capable of handling up to five pounds of material at a time. This size jar has been found to be about the best for handling ceramic colors and there are hundreds of them in use doing this work. After these come mills capable of handling from 15 to 100 lbs. at a time that are extensively used for glaze, slip, enamel, etc.

The Pebble Mills proper, which have been in use for 30 years or more, are offered in eight sizes capable of taking charges from 120 to 4,000 lbs. The second cut shows a No. 5 3 feet x 3 feet 6 inch Pebble Mill built with the cylinder in halves, bolted together, which is the exclusive design of this company and is an improved way of building this size machine.

The third cut shows the Abbé "Ideal" Spiral Feed

and Discharge Tube Mill, which is without question today the leader of this class of machinery in the world. Thirty-five of these mills have been installed in Sand-Lime Brick factories within the past two years with satisfactory results and quite a number have been supplied to gold mines recently where the fine pulverizing of ores has become an item of vast interest and great value, as the percentage of ore saved increases with the degree of fineness to which it is reduced.

Some of the features of the Abbé Tube Mill are that it runs on tires and rollers, instead of end trunnions, which procures for it a saving of from 25 to 30 per cent in the horse power required to operate it over other machines of the same size. It is equipped with the "IDEAL" Spiral Feed and Discharge, which is the greatest improvement that has been made on this class of machinery in many years. Formerly Tube Mills were fed with screw conveyors, which were constantly getting out of order, requiring stuffing boxes to stop them from leaking and a separate driving mechanism to operate. This meant serious delays incidental to expensive repairs. All these troubles are overcome by this simple arrangement mentioned, which is attached direct, needs no extra drive, requires no stuffing boxes,



Copyright, 1904, by Abbe Engineering Co.

No. 5, 3 ft. x 3 ft. 6 inch Pebble Mill.

has no separate moving parts, cannot get clogged up, in fact, is the acme of perfection. A full detailed description of the machines mentioned can be obtained by writing to the Abbé Engineering Company, 12th floor, 222 Broadway, New York City, who will gladly send you their eighty page illustrated catalog.

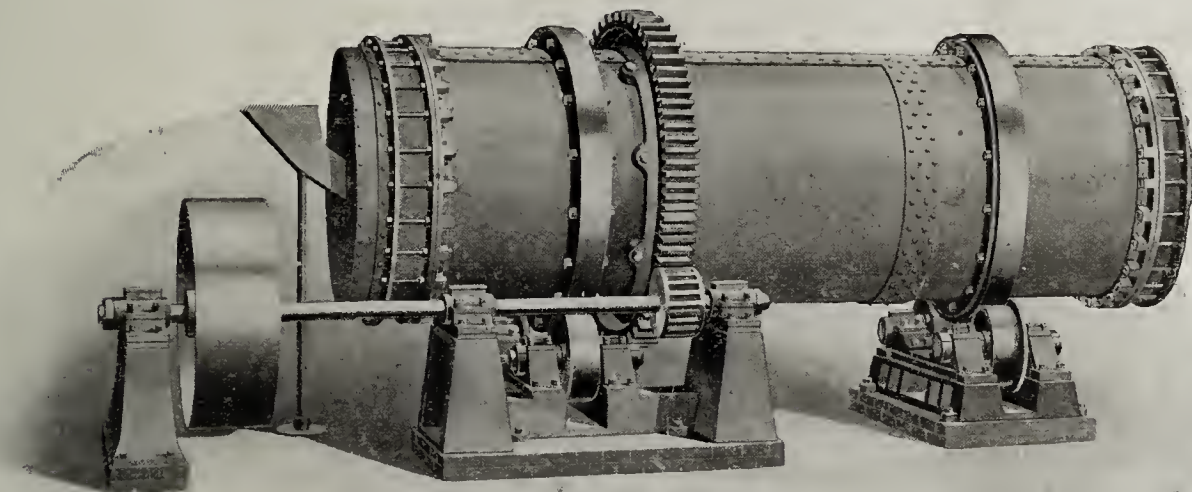
Albert B. Head of Paducah, Ky., has completed the organization of the Louisville (Ky.) Pottery Works, capitalized at \$100,000. Mr. Head is president of the new company and will move to Louisville. A location has been selected on the Louisville & Nashville Ry. at South Louisville.

THE INVESTIGATION OF STRUCTURAL MATERIALS.

Every prudent toiler who hopes some time to express his ideas of beauty, utility, and comfort in a house that he can call his own, should pray that Congress may approve the recommendation lately sent it by the Director of the United States Geological Survey, through the Secretary of the Interior, for an appropriation of \$100,000 to be expended in the investigation of materials used in building and construction work.

The poor man will not need to be told that the price of lumber and of brick soars slightly higher, year by year, and that while "the trade" may prosper, the people suffer. It takes vastly more pennies to one's credit in the savings banks than it once did to pay for the most modest home.

the St. Louis laboratories. These include sands, gravels, and stones. All samples will be tested as to weight, strength, durability, power of absorption, behavior when subjected to heat and cold, etc. Cement mortars when made with different grades of sand and gravel, stone screenings, etc., have been tested as to the relative proportions of these materials which yield the best results in the mortar in the way of strength, compactness, and other desirable qualities. The influence of time, temperature, and other variable conditions upon the setting, strength, porosity, permeability, and other properties of the cements and cement mortars has been studied. Concretes made in different parts of the country from cement with stone, stone screenings, gravel, sand, cinders, slag, etc., have been tested in the laboratory as to their strength, permeability, action



Copyright, 1904, by Abbe Engineering Co.

"Ideal" Spiral Feed and Discharge Tube Mill.

With the increase in cost of structural material, there is, alas! no corresponding gain in quality. On the contrary, the speed with which edifices of today fall down is in direct ratio to the speed with which the price mounts up. With the gradual disappearance of the plethora of wood in this country, the structural materials of the future will, necessarily, be steel, concrete, and clay products. It should be interesting, therefore, to every citizen to know that the United States Geological Survey conducted in 1902, 1903, and 1904 a series of examinations of materials suitable for the manufacture of cements found in different parts of the country. These examinations have already resulted in important industrial developments. During the Louisiana Purchase Exposition in St. Louis, the Survey began to investigate structural materials, especially cement mortars and concretes, and has continued the work down to the present day. The expenses of this work were paid out of two small appropriations, aggregating \$12,500, which Congress made early in 1905, and which are now exhausted.

What is the character of the investigations already made?

The nature and extent of the deposits of materials suitable for building and construction purposes which are used at the important building centers of the country have been investigated. Building materials collected by Survey experts in different parts of the country have been tested in

under freezing, fire, etc. These examinations have shown that there is great difference in strength and in other properties of the mortars made out of these different materials.

The continuance of this work is dependent upon additional appropriations by Congress. Inasmuch as Congress will probably vote for the expenditure of at least \$25,000,000 in the construction of public buildings during the next twelve months, it is evident that no individual builder in the country can be more benefited by these researches than the Government itself. The aggregate sum spent on building operations by the people of the United States last year was no less than a billion dollars.

NEGROES LEAVING THE FARM FOR THE NORTHERN BRICK WORKS.

Scottsburg, Va., April 24.—Today and yesterday there was an exodus of about three hundred negroes from this place to the brick yards on the Hudson. They bought their tickets over the Southern Railway, and go by way of Norfolk, and thence by water to New York, where they work until the cool weather of October drives them back to their genial clime for the winter. Their wages range from \$1.50 to \$2.50 per day. The brick works are capturing the last remnant from the farms, and reliance for farm work is nearly altogether thrown upon the farmer and his children.

SAND-LIME BRICK HAVE A GREAT FUTURE.

From an architectural point of view sand-lime brick of good quality possess great possibilities, and their popularity among builders has already stimulated a demand for them, which is apparent in the increase of the number of plants from two to 130 in five years. The architectural value of the sand-lime brick depends chiefly upon the durability of the coloring and their various shades obtained in their manufacture. As only oxides are used in making the brick, the color will not change. While the natural color is of a light gray like Indiana limestone various shades of gray, buff, brown and red can be obtained, which for exterior or interior ornamentation of buildings permits of many rich, beautiful Byzantine effects. Contractors who have employed sand-lime brick favor them because of their uniformity in size, which greatly facilitates the tying of the face brick with the seconds, and also demands less mortar and less time for laying them up in brick walls. The high grade sand-lime brick are not expanded, contracted or warped in the process of manufacture, and they can be produced in exactly uniform size and shape.

Chemically the sand-lime brick should be made of pure sand silicate and high grade calcium lime which acts as the bond. If properly made they are free from the flaws and fissures which make ordinary stone perishable through sudden contraction and expansion in changes of temperature. The sand-lime brick therefore resist fires in a building far better than stone, and are of particular value in walls constructed as much for fireproof qualities as for other purposes. Sand-lime brick and blocks improve with age. The chemical union of the ingredients becomes more uniform and firm the longer the brick are exposed to the air.

The fire-resisting quality of the sand-lime brick is an important feature of the manufacture, and it is one that has not received proper consideration. In a great many instances sand-lime brick have been confounded with ordinary clay brick, and it has only been recently that official tests by insurance experts have been undertaken to establish the relative value of the two. Laboratory tests conducted by Professor Woolson, of Columbia University, have also been carried on to ascertain the crushing and fire-resisting qualities of sand-lime brick.

In Germany sand-lime brick have been manufactured longer than in this country, and after years of testing the German Government officially approved of their use as fireproof materials. The brick are therefore extensively used in many parts of Europe for the construction of fireproof houses and walls. In Germany, however, the manufacturers have formed an association which seeks to establish a certain uniformity of grade of brick, and the result is very gratifying.

In this country sand-lime brick have passed through a certain period of depression and uncertainty which has resulted in the making of many inferior brick and blocks. The employment of these inferior brick has had a tendency in some quarters to prejudice architects and builders against

them. Like the manufacture of concrete building blocks, the sand-lime brick depend upon the method of mixing, curing and setting for their ultimate strength and fire-resisting qualities. The pure sand silicate and calcium lime are mixed in certain proportions until every particle of the sand is thoroughly coated with lime. The grading and sifting of the sand must be uniform so that when the mixture is put under heavy hydraulic pressure in the moulds all the interstices will be filled. The pressure to which the brick are subjected in the process of manufacture is 150 pounds, and this is maintained from ten to twenty hours. Within twenty-four hours the brick are removed, and some manufacturers use them immediately for walls. It is doubtful if they possess the requisite strength and bonding unity in such a short time for building purposes, and official tests have shown that at least several days or a week should elapse before using them in walls.

The question of uniformity of tensile strength has been studied to more purpose in Germany than in this country, and the manufacturers base their brick upon average tests and not upon special tests made for advertising purposes. High uniform tests cannot be depended upon, but where materials are the same and a certain pressure employed in the manufacture is adopted the average results can be taken as a standard. Thus in Germany sand-lime brick with a tensile strength below 1,970 pounds per square inch are rejected and considered of not sufficient strength for market purposes. This minimum test of strength has given to sand-lime brick in Germany a standard of value that makes them of particular value.

Uniformity of sand-lime brick is also largely dependent upon the ingredients employed. Variation in the quality and quantity of the lime is a fruitful source of failure, Lime must be of a high grade, for it is the bonding agent which after all determines the strength of the bricks. The purity of the lime depends upon calcium, magnesium and carbonate proportions, and this question is one that cannot easily be determined by the ordinary brick-maker without chemical analysis. Laboratory tests of lime used for bonding sand-lime brick have demonstrated that this variation is so great as to determine in many cases success or failure.

The quality of the lime taken from one quarry will often show considerable variation in the matter of the time required for its complete hydration. Thus one car lot of the lime completes its hydration within a few hours, and another lot requires nearly twice the time. Incomplete hydration destroys the brick, and if sold they prove of little real value in a modern building. This tends to give a bad reputation to the whole industry. Yet this has been repeatedly done in the past, and is one reason why sand-lime brick attracted popular favor so slowly five years ago. On the other hand the manufacturer is pretty sure to lose either his lot of brick or his trade if complete hydration of the lime is not obtained before the brick are removed from the presses.

It is therefore quite essential that a uniform grade of lime should be used and the period of its complete hydra-

tion ascertained in advance so that the brick will show a uniformity of strength and durability. The quantity of the lime required for making the brick cannot be trusted to luck or left to guess work. The tendency may be to use too little lime to secure the best results, but laboratory and practical tests have shown that an excess of lime is just as detrimental as a deficiency. Unless the lime has the right proportions of finely ground sand to work upon, its bonding strength is materially weakened. The question of determining the right proportions of lime and sand is one that concerns manufacturers and builders more than anything else. Accurate measurement and mixing are prime essentials to success in the work.

The sand-lime brick have already proved a most important factor in the building movement of the day, but it is not anticipated that they will displace the old burn-clay brick. It costs about as much to manufacture the former as the latter, and the final test of the durability of the new building material is time. This cannot be determined at present, but if laboratory tests are worth anything the sand-lime brick possess all the qualities essential for great wear and use. At present these brick are in the greatest use in regions where clay is scarce and sand pits plentiful. Fortunately for the building interests of the country sand is apparently very plentiful in regions where good brick-making clay beds are relatively scarce. A great variety of sand has been employed for this work, but it is evident that in time the different kinds will be graded for this work according to their composition. At present a fairly clean sharp sand rich in silica is considered the most suitable. This sand must be dried and at least ten per cent of it should contain 100 mesh or finer sand. The lime should be a high calcium oxide fairly free from magnesia, and properly burned. Before using to bond the bricks it should be well prepared and aged. The whole mixture of lime and sand should be reduced to a uniform consistency before being placed into the press. The standardization of the sand-lime brick will mean an important gain for the building interests of the country, and in the end it will prove equally profitable for the manufacturers.

The fireproof qualities of sand-lime brick are quite important factors. When properly mixed so that all interstices are filled with lime and fine sand, the effect of high temperatures on the bricks is not disastrous. Sudden expansion and contraction are not so noticeable as in stone and some other forms of building materials. In tests made with the sand-lime brick a temperature of 1,500 degrees did not destroy them, and when a cold stream of water was applied the disintegration was only slight. This was with high grade sand-lime brick, but as showing the variations possible in the material under poor workmanship some of the brick could be destroyed with a temperature of 800 degrees, and when water was applied they crumbled to pieces. Engineering tests are needed to demonstrate the ultimate strength of this building material for constructive purposes. Already many attempts have been made to manufacture the sand-lime material in the form of hollow

blocks for building purposes. These blocks are patterned after the cement building blocks, and possess in common with them many of the same virtues.

The demand for fireproof brick, tiles, cement blocks, and terra cotta building material is constantly increasing near our large cities, and the present fireproof movement must further stimulate the use of all suitable materials which can resist the ravages of fire. There is consequently a distinct gain in the discovery of any new fireproof building material, and it should not materially interfere with the business of manufacturing other kinds. In the Middle West where good clay beds are not so abundant, and sand is plentiful, the sand-lime brick industry has consequently increased rapidly, and the use of the brick for building purposes is having a distinct effect upon the fireproof movement of that whole section. The clays of that vast section have not in many cases proved up to the standard required for high grade brick and tile making, and the sand comes in as a valuable product of the soil to make building progress cheaper and more satisfactory. The cost of lumber of that region is also high, and this is another potent argument why sand-lime bricks must eventually revolutionize the building conditions of the Middle Western States.

BRICK PLANT PLAN IS CO-OPERATIVE.

Plans have been maturing in Grand Rapids, Mich., for the past month for the organization of a new company for the manufacture of cement and sand lime brick. The purpose of the company is to make cement brick during the summer months as the climatic conditions at that time are best suited for the purpose and sand lime brick during the colder period of the year.

It is claimed that a suitable site has been secured for the factory and that water power will be used. The plant itself will be run on a novel and ingenious plan of profit sharing that is different from any of the co-operative schemes now in existence.

On first employing any help for the plant the applicant will be given to understand that his services may be dispensed with after a period of three months if the company sees fit. Then after the probationary period of three months, if the new employe has stood the test he is invited to become a member of the company. After this has been done new applicants will serve a probationary term of only one month and will then be voted on directly by their associates.

The management will retain 55 per cent of the stock for the management of the plant and the other portion will be disposed of among the men. The management will make a semi-annual report on the conditions of business. If the business shows a profit, the regular dividend of 8 per cent will be paid to all stock holders and a 5 per cent contingency fund created. Then if a surplus still remains after this it will be equally divided among the employers and the men.

D. L. Stevens is at the head of the project and feels confident that the matter will be a success and that the plant will be ready for business this summer.

THE SUCCESS OF THE WILSON KILN AND DRYERS.

The two accompanying illustrations are the latest views of the Robinson Clay Product Co., a new Silica Brick Plant located at Akron, Ohio. This industry was started by J. Park Alexander in 1870, but met with little success on account of the refractory nature of the material; finally it fell under the master hand of Henry B. Sperry, who discovered and patented several processes of making this material into brick, with the assistance of the engineers of the Wilson Kiln & Dryer Co. of 503 Market St., Pittsburgh, Pa., and later by the adoption of the Wilson Kiln, the material was placed on the market as a merchantable product; previous to this, while the brick could be made, it seemed impossible to burn them in an ordinary kiln so that they would stand transportation to any distance.



Plant of the Robinson Clay Products Co., Akron, Ohio.

The Robinson Clay Product Co., who were also located at Akron, Ohio, and who had several plants in the vicinity of Akron, were interested with the success of the company, finally purchasing the plant, but still kept it under the management of Henry B. Sperry.

The success of the old plant necessitated a new one, which the accompanying cuts will show. This plant has been under construction for several months, and was recently put in operation. The plant has a capacity of 40 to 50 thousand high grade silica fire brick per day.

The material has been subjected to 3,500 degrees Fahrenheit in the Wilson Brick Kiln; at this temperature the brick are thoroughly burned and ready for market. Practical brick men who have made themselves acquainted with this material say it is one of the best materials in the country.

The new plant is under the supervision of Mr. Henry B. Sperry, who is a pioneer in the brick business, and understands it thoroughly. The new plant has a bright future before it.

We are advised by the Wilson Kiln & Dryer Co. that work on the Perry Mfg. Co.'s new plant at Perryopolis, Pa., is progressing rapidly. They hope to have it in operation by the first day of July. The plant will have a capacity of 30 to 40 thousand fire and building brick per

day. It will be modern and up to date in every way, using the Wilson Kiln & Dryer Co.'s improvements throughout.

The Pittsburg-Buffalo Co., Pittsburg, Pa., are running their plant day and night. They made a high grade face brick, and after trying several types of kiln, have adopted the Wilson Kiln as superior to all others. They are now building several, and when they get all their kilns finished they will have a capacity of 150 thousand high grade building brick per day. The future prospects of the plant are very encouraging. Mr. John H. Jones, the president of the Pittsburg-Buffalo Co., a very enthusiastic brick man, has been very successful in everything he has undertaken. He advises the writer that he expects to continue the enlargement of the plant as long as business demands it. He believes in keeping up with the times.

The C. P. Mayer Brick Co., Bridgeville, Pa., who make a specialty of high grade face brick, have sold their entire product of 5,000,000 face brick. Mr. C. P. Mayer, although a beginner in the brick business, has been very



Plant showing Wilson Kilns in Foreground.

successful from the beginning. He adopted the Wilson Kilns, and at the present time he is increasing his capacity as rapidly as possible by building several more Wilson Kilns. When the plant is completed the capacity will be 10,000,000 brick annually.

THE SEMISTEEL CO.'S NEW CATALOGUE.

Sand Lime Brick Machinery is the name of the latest catalogue of the Semi-Steel Company of New England Building, Cleveland, Ohio. This company is meeting with great success in installing complete plants and furnishing all of the machinery. Their machinery is designed for Simplicity, Strength, Power and Durability.

The tallest sand lime brick building in the world is made out of brick made on Semi-Steel Co.'s machinery. The process in detail is described. The Theory, and the Sampson Press, the Mixers, Hardening Cylinders, the cars, are all described.

If you are interested in sand-lime brick it may be well for you to write for this catalogue and mention the CLAY RECORD in writing.

A STUDY OF THE RECENT CALIFORNIA EARTHQUAKE.

Among the members of the United States Geological Survey in the neighborhood of San Francisco at the time of the recent earthquake was Mr. G. K. Gilbert, geologist, who has been engaged several months in making hydraulic experiments in the mining laboratory of the University of California at Berkeley. Instructions were telegraphed him immediately to make as thorough a study as possible of the earthquake phenomena.

Mr. Gilbert is one of the most experienced and best-known geologists connected with the Federal Survey. He was with the Ohio Survey from 1868 to 1870, with the Wheeler Survey from 1871 to 1874, with the Powell Survey from 1875 to 1879, and has been a member of the Federal Survey since its organization in 1879. His writings have been numerous. Chief among them are his works on Lake Bonneville and the geology of the Henry Mountains. His Introduction to Physical Geography, which he wrote in collaboration with Prof. A. P. Brigham, is accepted in the schools of the United States and Canada as a standard text book. He is widely known as a student of glaciology and has published much on that subject. His researches into that field have taken him frequently into the high sierras of California, so that he is thoroughly familiar with the geologic history of that State. Of his many papers on glaciologic subjects, probably the best known is his work on Glaciers and Glaciation, which constitutes the third volume of the reports of the Harriman Alaska Expedition, of which he was a member.

Investigation of the earthquake phenomena at San Francisco will be a congenial subject to Mr. Gilbert, since he has already devoted considerable time and thought to seismological problems. He is the holder of a small grant from the Carnegie Institution for the investigation of subterranean temperature gradients. In 1884 he published an article on the theory of the earthquakes of the Great Basin, in the American Journal of Science; in 1889 he contributed an article on the strength of the earth's crust to the Bulletin of the Geological Society of America. The September number of the National Geographic Magazine in 1897 contained an article by Mr. Gilbert on the modification of the Great Lakes by earth movement and in the eighteenth annual report of the Director of the Geological Survey, 1898, was included a dissertation by Mr. Gilbert on the recent earth movement in the Great Lakes region. More recently, Mr. Gilbert published, in Science, December 16, 1904, an article on the new seismology which was a review of the work by Maj. Clarence E. Dutton entitled "Earthquakes in the Light of the New Seismology."

Volcanic phenomena have also interested Mr. Gilbert. A theory of the formation of lunar craters was set forth by him in 1893 in Astronomy and Astro-Physics, laccolites in southeastern Colorado were described in the Journal of Geology in October and November, 1896, and the mechanism of the Mont Pelee spine was discussed by him in the issue of June 17, 1904, of Science.

NEW HAMPSHIRE SUPREME COURT DECIDES AGAINST OLD COLONY TRUST IN BATTLE WITH CREDITORS OF BRICK COMPANY.

A recent decision of the supreme court of New Hampshire in certain cases growing out of the foreclosure of a mortgage by the Old Colony Trust Company upon property of the New England Brick Company has attracted considerable attention on account of the important legal questions involved, and also because it constituted one of the incidents in the history of the development of the brick trust in New England, of its speedy termination, and the final reorganization of the company upon a sound basis.

The main question before the court in the New Hampshire case, although several minor questions were involved, was the question of the validity of a mortgage made by a corporation upon after-acquired property and the validity of an agreement by which the mortgagee of the New England Brick Company was permitted to sell the mortgaged brick as manufactured, without applying the full proceeds directly to the payment of the mortgage debt, but instead thereof reserved a certain portion of the proceeds of the sales of the brick to constitute a sinking fund which was to be accumulated from year to year, to be finally applied in extinguishment of the mortgage debt. The court held that such an arrangement was not valid under New Hampshire law, and that the mortgage would not be good as against attaching creditors of the brick company.

The amount involved in the case was considerable, as numerous creditors of the brick company had brought suits and attached the property of the company, consisting of brick in kilns and large amounts of wood in the yards of the company, and sought to hold the same as against the Old Colony Trust Company, trustee for the mortgage bondholders of the brick company. There were some 20 suits of this kind pending in Rockingham and Strafford counties and one or two in Merrimack and Hillsboro counties. These are all practically disposed of by the decision of the court in favor of the attaching creditors, and the amount due such creditors is now in the process of adjustment by the payment of the claims.

OPENING OF THE GREAT SHOSHONE RESERVATION.

It is expected that the rush to the opening of the great Shoshone Reservation, in Wyoming, Aug. 15, 1906, will far surpass anything in our history. Fabulous stories are widely circulated as to agricultural, grazing, timber and mineral wealth—particularly as to the deposits of gold, silver and copper—of the reservation, which has an area of 2,283 square miles, larger than that of Delaware or Rhode Island.

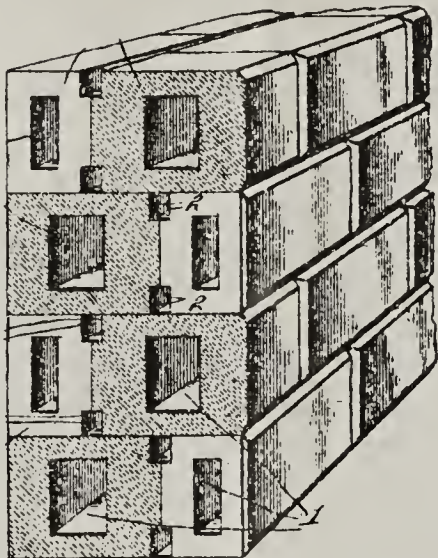
The National Tribune, Washington, D. C., will shortly publish an invaluable handbook of this region, finely illustrated with maps and pictures and giving all reliable information that is obtainable in regard to it from official surveys and other sources. It will contain all that is definitely known up to this time. This book is not for sale, but can be obtained by sending one year's subscription—\$1—to The National Tribune, Washington, D. C.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

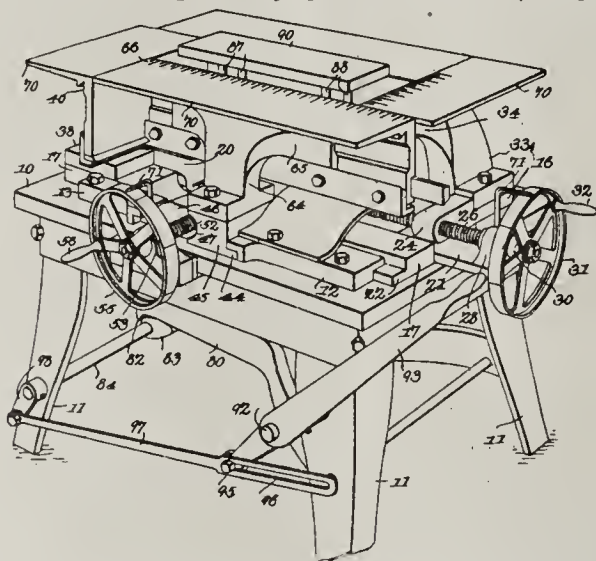
814,973. Building-Block. John Lovett, Martinsburg, W. Va. Filed Jan. 20, 1905. Serial No. 241,958.

Claim.—A wall composed of hollow blocks having recessed inner corners extending throughout the length of the blocks, said block so placed in the wall that the corner-recesses come together, these recesses at the corners overlapping the main orifices in the center of the blocks, whereby to completely insulate and prevent dampness from passing therethrough.



A wall composed of hollow building-blocks each block having an upper and lower recessed corner, the recesses extending through the length of the block, whereby an intervening projection is formed, said projection placed against each other in the wall, whereby channels are formed between the upper and lower ends of adjacent blocks corresponding to the width of two of the corner-recesses.

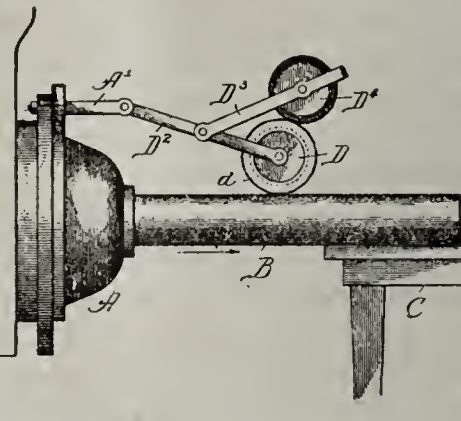
815,098. Cement-Block Machine. Andrew Klay, Bluffton, Ohio. Filed Aug. 28, 1905. Serial No. 276,138.



Claim.—In a block-forming machine, a mold having movable side and end walls, means for loosely connecting the walls of the pairs, each pair constituting a side wall and an end wall, and a mold-opening means serving to space the walls from the molded block, and then to simultaneously move each pair of walls, one wall of each pair moving directly away from the block, and the other in a direction in parallel relation therewith.

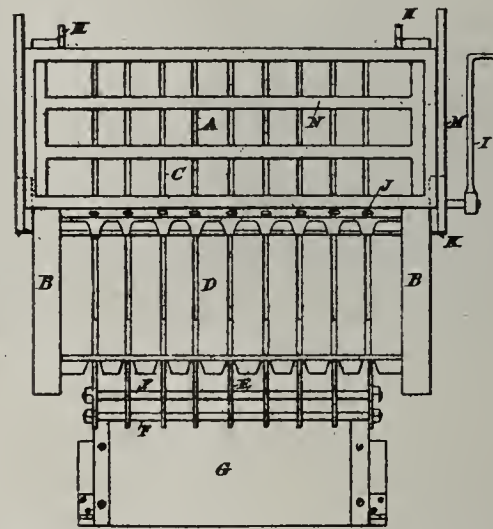
815,238. Marking Implement for Green Clay Articles. Ernest Von Oven, Naperville, Ill. Filed Nov. 13, 1905.

Claim.—A marking implement for green clay articles, comprising a body provided with a legend-bearing surface, and a covering of oil-absorbing material secured to said body to extend over said surface and through which the impression is made.



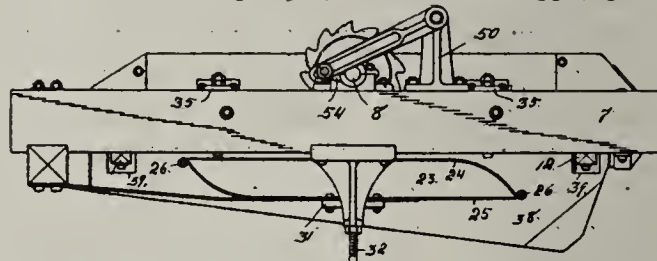
Claim.—A marking implement for green clay articles comprising, in combination, a roller carrying legend matter on its periphery and provided with a support on which it is journaled and with a thin covering of oil-absorbing cloth extending about said periphery and through which the impression is made, and an oiling device consisting of a roller provided with an oil-absorbing pad about its periphery and a support on which said oiling-roller is journaled and which is pivotally connected with said first-named support to cause the pad of the oiling-roller to bear against the covering on the marking-roller.

814,742. Machine for Pressing Concrete Bricks. Henry H. Spears, Louisville, Ky. Filed June 10, 1905. Serial No. 264,557.



Claim.—In a machine for pressing concrete bricks and containing a mold and a frame of slides for dividing the mold into chambers, a lid with slots running through it where it meets the slides of the same length with these slides, which slots widen upward into gutters.

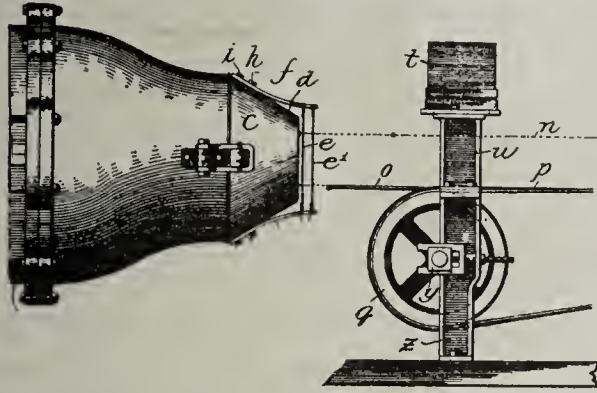
814,952. Vibrating Screen. Norman V. Fitts, Denver, Colo., assignor to The Colorado Iron Works Company, Denver, Colo. Filed Dec. 5, 1904. Serial No. 235,465.



Claim.—In a vibrating screen, the combination with a stationary frame, of a screen provided with a frame relatively movable with reference to the stationary frame, springs centrally connected with the screen-frame and suitably supported, said springs being composed of members

connected at their extremities and supported intermediate their extremities, tie-bars connected with the said springs at one extremity and with the stationary frame at the opposite extremity, multiple cam-wheels engaging the central portions of the screen-frame on opposite sides whereby the said frame is alternately depressed and released, and suitable means for limiting the reverse movement of the screen-frame.

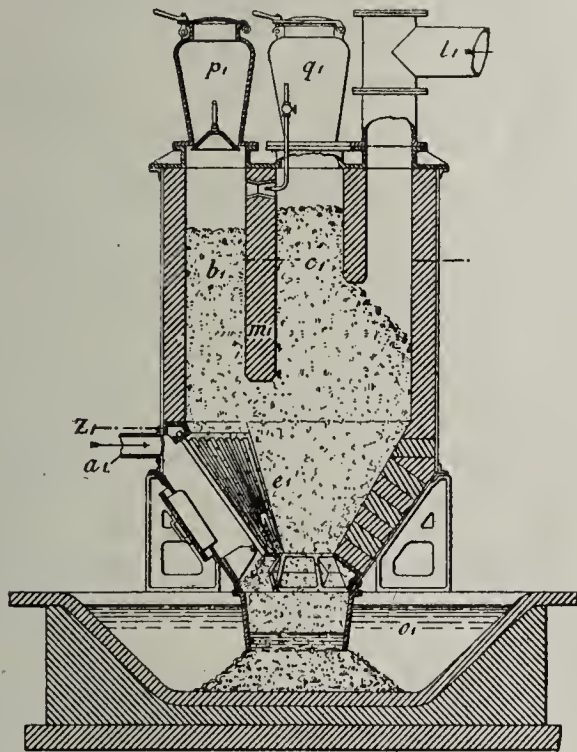
815,398. Clay-Working Machine. Frank Alsip, Chicago, Ill. Filed April 24, 1905. Serial No. 257,188.



Claim.—In an automatic switch, the combination with a pivoted switch-point having an arm connected therewith for turning said switch-point, a bar for each of the joining tracks, extending longitudinally of the same, each bar being pivotally connected with said arm, vertically-disposed shafts and cams for operating said bars, each of said shafts being provided above the surface of the ground with a turning-block adapted to be engaged by an approaching car, substantially as described.

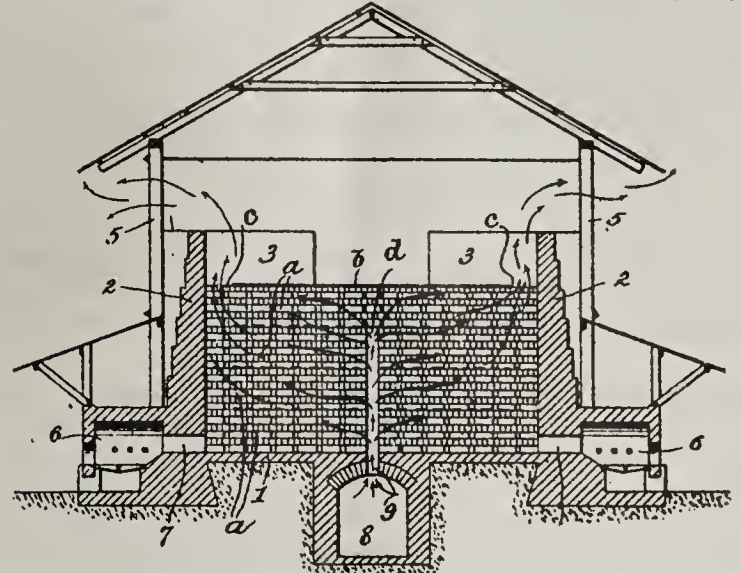
815,794. Gas-Producer. Alberto Cersoli, Rome, Italy. Filed April 22, 1904. Serial No. 204,433.

Claim.—A gas-producer having a slanting grate in the lower part thereof and the upper part of which is divided into several compartments of different depth by hanging partitions parallel or quasi parallel to the slanting grate, two or more adjoining compartments being provided with



hoppers on the top to charge them with fuel so that a portion of this fuel is delivered by gravitation direct onto the grate and in the body of the producer and so that the fuel is distilled by coming into direct contact with the hot gases, and the other of said compartments forming a gas-outlet chamber, and a gas-outlet pipe communicating with said gas-outlet compartment, substantially as set forth.

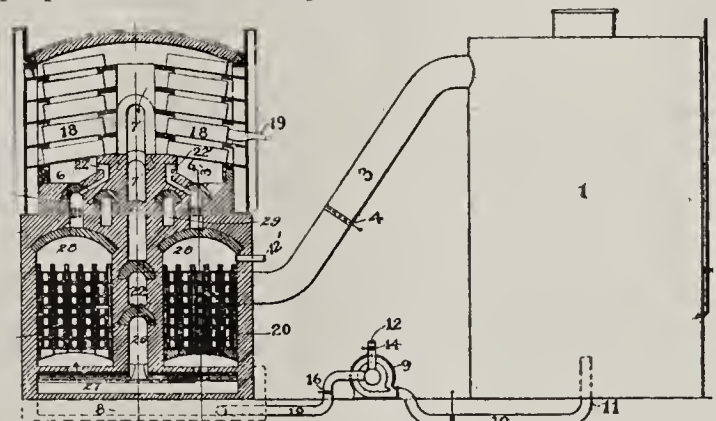
816,386. Method of Treating Plastic Material. Alexander A. Scott, Knoxville, Tenn. Filed Nov. 13, 1905.



Claim.—The herein-described method of treating plastic material, which method consists in forming said material, in the green state, into blocks; then setting said blocks in a plurality of superposed groups within a compartment, said groups extending to the lateral walls of the compartment and having an upright flue-spacing between said lateral walls, each successive group being subjected to the action of an artificially-moved drying agent before another group is set thereon, said drying agent being made to rise through said flue-spacing and move thence laterally through the then last of said groups and then upward out of said group; and then passing a highly-heated gaseous medium into the base of said mass from opposite sides and thence through said mass, substantially as described.

816,973. Gas Producing and Consuming Apparatus. Carleton Ellis, New York, N. Y., assignor to Combustion Utilities Company, New York, N. Y., a Corporation of New York. Filed Feb. 3, 1905. Serial No. 243,928.

Claim.—In apparatus for reducing and distilling metals, the combination of a gas-fired furnace provided with metal-distilling retorts of refractory material, a gas-producer supplying gas to the furnace, means for abstracting products of combustion from the furnace and delivering the same, admixed with air, into the producer, and means for regulating proportions of air and products of combustion.



In apparatus for reducing and distilling zinc, the combination of a gas-fired furnace provided with zinc-distilling retorts of refractory material, a gas-producer supplying gas to the furnace, a continuous regenerator having passages in heat-transferring relation for the products of combustion from the furnace and the air entering the furnace, respectively, a conduit provided with a fan abstracting a portion of the products of combustion and delivering the same into the gas-producer, means for supplying air to said conduit, and means for regulating the relative proportion of air and of products of combustion delivered by said conduit.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico
and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the sub-
scribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII.

APRIL 30, 1906.

No. 8

"I like to read American advertisements. They are in
themselves literature, and I can gauge the prosperity of the
country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the
very time that advertising should be the heaviest. Ninety-nine
out of every hundred merchants advertise most when there is
least need of it, instead of looking upon advertising as the pan-
acea for their business ills.—John Wanamaker.

Don't scrap with your competitors—get out of that class
into one higher up.

A wise man does not attempt to pull himself out of
trouble with a corkscrew.

Consider the lowly postage stamp, Willie Bump, and
learn the secret of success. It sticks to one thing until it
gets there.

The CLAY RECORD is the only semi-monthly clay journal
in America. It costs only one dollar for you to get the
news before it is stale.

Don't discount ideas; today's achievements are yester-
day's ideas grown up. Don't lose them by neglect. Don't
reason them to death.

The advertiser who sticks issue after issue, month after
month and year after year, is, after all, the surest check
on the value of a journal. Please look over the CLAY
RECORD with this fact in mind. Look at this issue and that
of several years ago. You will see a great many of the
same faces in the old numbers, a large portion of them.
If you are not advertising in the CLAY RECORD, now is the
time to start. It is not too late.

These columns, our readers have doubtless observed,
have been freely given to the setting forth of the advantages
of producer gas as a means of developing power, and our
liberality in this direction is due to the fact that we plainly
see it is the coming power developer; and as the turbine
is superseding the reciprocating engine, likewise the gas-
engine, will supersede both.

One has only to compare the practical and theoretical
efficiency of the internal combustion engine with that of
the most modern steam engine to be convinced there are
no wild-cat claims of the superiority of the former. The
thermal efficiency of the internal combustion engine is
from two to five times of the average externally fired heat
engine, and when it is taken into account that the smallest
gas engines have a thermal efficiency from 20 to 24 per
cent, while the modern steam engine turns into work only
12 per cent of the heat supplied under normal conditions,
one wonders why we are not using gas engines.

Again, when it is considered that the waste heat, say
70 per cent supplied by the producer, as can be used for
heating very much in the same way as exhaust steam from
the steam engine; and that a higher temperature can be
maintained with exhaust gases than with exhaust steam,
and other features we might enumerate, we can only won-
der that Gas Producer Plants and Gas Engines are not
found everywhere.

POTTERS LOSE OPPORTUNITY.

Another evidence of the attitude of indifference of
American potters toward their industry was made evident
when it was announced that the project to establish a per-
manent exhibit in the national museum at Washington had
been abandoned.

At their convention last December, the United States
Potters' Association decided to collect pieces from the dif-
ferent American potteries and place them in the national
museum so that all visitors, native or foreign, might see
and know the proportions that this industry was assuming.
It was also thought that this would be a good way to dissi-
pate the erroneous idea prevalent that the American ware
did not possess the artistic qualities of the foreign.

The Art and Design committee, of which Mr. Frank R.
Haynes, of Baltimore, is chairman, was entrusted with the
task of collecting these several examples and arranging
for their proper exhibition.

The committee went to work on this project and labored
honestly in behalf of its accomplishment. The different
potters were duly notified of what was under contempla-
tion, and on more than one occasion urged to forward some
pieces of their wares. Some took up the matter in a busi-
nesslike, live sort of manner and complied with the com-
mittee's request, but the large majority did not even take
the trouble or time to send in a refusal. They treated the
matter with rank indifference. The consequence is that

the committee has announced that owing to the latter fact it has been decided to let the matter drop for the time being at least.

Those who showed such little interest in the welfare of the American pottery industry are open to criticism and condemnation. While we are not prepared to say that the exhibit if established would have accomplished everything that some believed it would, still the mere establishment of it would have shown a progressive spirit and would have been evidence that those engaged in the pottery industry were "live ones." It is another instance of lost opportunity, with which sign the American potter is pretty well labeled by this time. It is just such failures, indifference, lack of energy and utter disregard of the fact that they are living in a progressive age that accounts for the fact that American potters as a class do not stand higher with the American public. However, there is this consolation, at least, that those who are alive to the possibilities and who are showing energy and a desire to make their product the equal of any, will find the sledding much easier, and in time will have the field to themselves.

STRIKE ON IN POTTERIES.

A strike of 500 pottery workers is on at Crooksville, Ohio. The employes of eight of the potteries of the thriving little town walked out and since have refused to return to work. Practically a cessation of pottery manufacturing in the town has been brought about and it was stated by a prominent potterman of that place that at present there is little hopes for an early settlement of the difficulties.

The reason given by operators for the strike is that a new wage scale has not been signed. It is said that ever since the first of the new year the wage scale has been under discussion but has never been signed. It is thought that by the strike at this time a recognition of the Operative Potters' Union will be brought about.

It is understood that no increase in wages is being sought, nor a shorter work-day. No advances on the part of either potters or operators to effect a settlement had been reported. However, it is expected that a settlement will be effected during the next few days, for it is believed the operators cannot afford to hold out much longer.

In the list of potteries where the strike is on are Star potteries Nos. 1 and 2, Burley & Winters, Keystone Pottery Co., Diamond Stoneware Co., Globe Pottery Co., The A. E. Hull Pottery Co., and one other. A number of the striking workmen have applied for positions at the potteries in Roseville.

The burning of the plant of the Globe Stoneware Co. a few weeks ago threw about 50 pottery workers out of employment. The general strike of potters in Crooksville at this time comes quite unexpectedly.

Mr. J. Frank Boyer, Norristown, Pa., is installing at Spring City, Pa., the "Martin" Patented Rack Pipe Steam Brick Dryers, having a holding capacity of 32,000 stiff mud brick, and including Delivery System.

OBITUARY.

S. M. Morrison, president of the Denver (Colo.) Pressed Brick Co., died at his home from Bright's disease. He was 62 years old. He was a pioneer of Denver.

John A. Kline, aged 32 years, a member of the firm of John Kline & Sons, brick contractors, died at his home, 7311 Butler St., Pittsburg, Pa., of heart disease.

Harry R. Fox, manager and a member of the J. B. Fox Brick Co., Toledo, Ohio, died at his home, the third one of the family to die within four months. He leaves a wife and one child.

S. P. Belcher, superintendent of the Allentown (Pa.) Paving Brick Co.'s plant at Guth's station, was stricken with heart disease and fell dead on the railroad track, where he lay some time before found. He was 50 years old.

Frederick Herman, aged 61 years, a veteran of the Civil War and a well-known brick manufacturer, died at his home, 89 Woodland Ave., Allegheny, Pa. He and Mrs. Herman were making arrangements for their golden wedding which was to be held a week later. He leaves a wife and seven children.

ACCIDENTS, DAMAGES AND LOSSES.

The Progressive Pottery Co., Roseville, Ohio, has been dissolved and F. M. Rider has been appointed receiver.

The Millersburg (Ind.) Brick and Tile Co. is in the hands of a receiver. The plant was not a paying proposition and the affairs will be wound up.

The Greenfield (Ind.) Brick Co. had all the brass on the engine at their plant taken off by boys and sold for junk. The loss will amount to \$400.

The Rose Fire Brick Co.'s plant, erected near Clinton Station, outside of San Francisco, Cal., was leveled by the earthquake and is almost a complete loss.

The National Tile Company, Anderson, Ind., had the branch works and office in San Francisco, Cal., demolished and entirely destroyed by the earthquake.

The Chattahoochee Brick Co., Atlanta, Ga., is a defendant for a \$5,000 damage suit on account of one of the company's teams running over Hebert Vaughn while on his way to school.

Cora Zeigler has brought suit against the Michigan Vitified Brick Co., Bay City, Mich., for damages caused by heat, smoke, dust and ashes from their plant injuring her property.

The brick kiln at the J. E. Schroepel Brick Yard at Edwardsville, Ill., caved in and five workmen had a narrow escape from being injured. The kiln was only partly finished and caved in as the top was being rounded out.

ANOTHER BRICK PLANT FOR GULFPORT.

The Ross-Keller Triple Pressure Brick Machine Co. of St. Louis, Mo., have just closed a contract with Mr. O. T. Cassibry of Gulfport, Miss., for the installation of a complete four mold brick plant to be located near Gulfport. The machinery is now being shipped and the plant will be in operation about the first of June.

THE CONDITION OF THE BRICK TRADE AT CHICAGO.

The strife which has existed in the Chicago brick trade for several weeks reached more distressing proportions yesterday, when announcement of a cut to \$4.50 per thousand was made by some of the independents. This price quoted is on brick delivered, which means a net averaging considerably less than \$4. Such a quotation apparently means a sacrifice of all profits, if not a positive loss.

Contractors have been quick to take advantage of the situation and there is no telling where the fight will now end. While no official statement has been given out by the Illinois Brick company with regard to prices, it is understood that they have sold but a proportionately small amount of brick for less than \$5.50 per thousand. The combined capacity of the various independent manufacturers in Chicago and immediate vicinity, however, is large and will, it is said, exceed the Illinois company's present capacity by the ratio of 2 to 1, so that the attitude of the independents in apparently slashing prices regardless of the consequences to the trade is alarming.

In the natural course of events the Illinois company will likely be compelled to meet the prices of its competitors, notwithstanding the strong position occupied by it. Officers of the company are reassuring in their statements of the general conditions and say earnings are safe. The whole matter, of course, depends entirely on to what extent the present struggle is prolonged.

The independents assert that they have the advantage in the present fight, as their properties are managed and operated by the owners, thus making it possible to undersell the Illinois Brick company. While the smaller manufacturer has in a sense the advantage in this particular, experience has proved that a larger concern has the commanding position in the long run.

With regard to the position of the Illinois Brick company, a director says:

"I do not know of a corporation that is in a stronger financial position than the Illinois Brick company. There is a much larger available surplus in cash and quick assets than was shown at the close of the year, and the company has no doubtful accounts that are being carried as assets. Everything of that character was written off at the close of the previous fiscal year. Since then many of these accounts have been paid on a basis of 50 and 75 per cent of their face, and even at par. This income might be considered velvet, and has already amounted to a great deal.

"The plants are in excellent physical condition, having been put in such shape last year, thus there has been no necessity of important expenditures in that direction this year. Moreover, the requirements during the remainder of the present fiscal period will not exceed the ordinary depreciation charge for wear and tear. Dividends are safe enough at the present rate, and I have the utmost confidence in the ultimate value of Brick stock.

"The talk of competition seems to have led a few persons to believe the stock was too high, but it will be remem-

bered that the shares have never sold above 72. None of the important shareholders has sold stock, but on the contrary, some of the directors have paid a great deal more than current prices for some of the stock which has been sold during recent weeks. As to competition I can only say that if we are to have such the company is well able to meet it."

COAL STRIKE AFFECTS BRICK BUSINESS IN IOWA.

The coal strike is affecting the brick yards in Des Moines, and elsewhere as well, seriously. All are shut down, nearly all are behind with their orders, especially for building brick, and building operations are tied up in consequence.

Some of the larger brick concerns of the city are filling orders taken some time ago and from the supplies now in their yards, but these supplies are becoming exhausted. The manufacturers are counting on the miners and operators reaching an agreement soon and upon them being able to go forward with their work and meet their contracts.

Building brick is not alone scarce in Des Moines, but, according to reports, all over the country. A traveling salesman for a brick concern in Des Moines stated that in St. Louis, even, there was a shortage in building brick. On paving brick the manufacturers are not so badly crowded. The general building boom throughout the country has caused a big demand.

In Des Moines face building brick are selling at the yards at \$15 per thousand, while the ordinary building brick brings \$8.50 at the yards. The price on the latter is 50 cents higher than last year, and on the former the same as a year ago. But with the scarcity of brick building operations are suspended in many instances until at least the coal strike is settled and there is a fair prospect of the manufacturers catching up with back orders.

The high price of lumber is also turning many people toward brick for all kinds of purposes. Contracting agents for the Chicago, Milwaukee & St. Paul Railroad and for the Chicago, Minneapolis & Omaha, the latter part of the Northwestern system, have recently been in correspondence with Des Moines brick firms relative to the cost of using paving brick at all of their grade crossings, instead of lumber. It is the judgment of these railroad purchasing agents that brick will supplant lumber for this sort of work as their first cost is not much more and their durability considerably greater.

The Flint Brick company is completing its new drier during the suspension of work. When this is completed, with its other improvements, their plant will have a capacity of from 60,000 to 75,000 per day. The brick plant of the Barber Asphalt Co. is rapidly going up. It is to have a capacity of about 90,000 per day.

Rush E. Evans, Dayton, Ohio, is building a four machine sand lime brick plant, expecting to have same in operation in June, making 150,000 brick daily.

THE PIONEER PLANT SOLD AGAIN.

The annual sale of the plant of the Pioneer Fireproofing Co., Ottawa, Ill., took place on March 28, 1906, when the plant and all the properties, including franchises and leases, were sold by the Federal Clay Mfg. Co. of New Jersey to the National Fire Proofing Co. of Pennsylvania.

The deed transferring this property was filed for record in the office of the county recorder. The consideration is given in the deed as one dollar, but this is a mere formality. The actual amount is suppressed for various purposes. The Pioneer plant has been sold and resold about half a dozen times in as many years. The Pioneer Fireproof Construction Co. sold to the Pioneer Fireproofing Co. and this company one year ago sold to the Federal Clay Co., and now this company transfers the entire property to the National Fire Proofing Co., otherwise known as the trust.

The change of ownership will make no difference as far as the operation of the plant is concerned.

WHITNEY REDUCTION CO. GIVES ORDER FOR 25,000,000 BRICK TO SALISBURY FIRM.

G. W. Isenhour, Salisbury, N. C., the largest brick maker in this section of the State, has made a contract with the Whitney people whereby he supplies them with 25,000,000 brick. To complete this job will require more than three years and this allows the machine to turn out 100,000 weekly. The mill is the product of J. C. Steele & Sons, of Statesville. It is their largest and most improved make and is capable of an enormous amount of work and almost limitless duration. Just what the Whitney men mean to do with all of these brick cannot be learned yet. It is certain that there will be a large water power cotton mill and may be more than one. There will be other brick manufacturing factories and the many millions can be used.

TO DIG CLAY FROM RIVER BED.

The New Castle (Pa.) Clay Company will begin this week to dig clay from the bed of the Delaware River. This will be shipped on barges to a Philadelphia brick manufacturer.

There are half a dozen varieties of clay in the veins opposite the Riverside farm of J. Edward Addicks. When Contractor McNichol was putting in the filter plant at Torresdale, the New Castle Clay Company supplied nearly 300,000 tons of Delaware River clay, which was placed at the bottom of the filter beds and puddled.

The clay to be dug this season makes a buff brick. Dredges, barges and tugs are expected to arrive soon.

LEASING MORTGAGED PROPERTY.

If you are leasing premises for a period of years, do not forget that a prior mortgage or trust deed on the property, if foreclosed, will shut you out. In case the leasehold it is important as a business proposition, it should be ratified by the holder of the securities, and, to avoid any mistake, a memorandum of such approval should be indorsed on the principal note. Capital invested by a lessee in expensive improvements would be lost if a prior incumbrance should be foreclosed.

HUDSON RIVER BRICK MANUFACTURER WILL FIGHT UNIONS.

That the brick manufacturers of the Hudson Valley and the Hackensack district mean to fight the newly-organized branches of the Tile, Terra Cotta and Brick Workers' Association was manifested at Haverstraw. Seventy-five per cent of the manufacturers of these two regions were present and unanimously agreed that they would not treat with organized labor in any form. The meeting was one of the largest ever held by the brick men, and plans for a combination to fight the unions were formulated. The manufacturers will also form local organizations for mutual protection, and district committees were appointed for this purpose.

For several months the brickyard workers have been organizing from Haverstraw to Coeymans. Two local branches have been formed, one at Port Ewen and the other from Kingston Point north. All along the river have been rumors of the demands the workers would make in the spring as soon as the yards would open. To offset this the manufacturers met on Thursday and quickly were a unit in action. The large majority spoke in favor of refusing to treat with the workmen as an organization. The sentiment, as one manufacturer expressed it, was: "We will run our own yards and will take no dictation from walking delegates or business agents. If the bricklayers in New York refuse to lay our brick, they will lay no brick. If any difficulty is experienced on the opening of yards this spring every manufacturer will shut down along the Hudson River. A repetition of the boycott of 1887, when the New York workmen refused to lay Hudson River brick, will result in the same fiasco. The boycott lasted two months, but in the end the workmen were willing to give in."

"COMPRESSED AIR" ISSUED IN ENLARGED FORM.

"Compressed Air" announces that with its issue of May it will appear in enlarged form and under new management. Hereafter it will be published by the Kobbe Co., 90-92 West Broadway, New York. For ten years "Compressed Air" has been, and still is, the only publication devoted exclusively, and covering completely, the field of compressed air in all its applications. This field, however, has broadened so materially within the last few years that a more comprehensive periodical is needed to fully meet the new conditions. With the May number, therefore, the size of "Compressed Air" will be changed to 7 x 10, it will be printed on better and in outward form will be on a par with the best printed magazines now published.

Mr. W. L. Saunders, M. Am. Soc. C. E., will remain as Editor-in-Chief; M. R. Hulbert, M. E., will be Managing Editor, and P. F. Kobbe, Jr., will be Business Manager. Contributions and correspondence from those interested in the uses and development of compressed air for industrial purposes will be gladly received and made use of if acceptable, and requests for information will be given prompt and courteous attention. All subscriptions and correspondence in future should be addressed to The Kobbe Co., 90-92 West Broadway, New York.

POTTERY NEWS ITEMS.

It is rumored that the stockholders of the Oliver China Company, Sebring, O., will build a new pottery in Sebring during the coming summer.

The Western Stoneware Co., Portland, Ore., has been incorporated with \$100,000 capital stock. M. W. Baldwin is president. C. E. Eaton, secretary and treasurer.

The Roodhouse (Ill.) Novelty Pottery Co. has been incorporated with \$15,000 capital stock by William H. Ainsworth, Edward H. Higbee and Henry C. Worcester.

The board of directors of the Standard Porcelain Co., New Cumberland, W. Va., met promptly and passed resolutions to repair and restore the burned plant and machinery at once.

H. B. Peters has bought at trustee sale the property of the Lancaster (O.) Pottery Co. Consideration \$2,975. It consists of 2 acres of land, buildings and machinery, appraised at \$4,000.

William Mason, formerly connected with the La Belle pottery at Wheeling, W. Va., has purchased controlling interest in the plant and will move to Wheeling and assume the management.

The trustee of the Barberton (Ohio) Pottery Co. has resold the pottery to Mr. O'Neill of Akron. Consideration \$35,300. Before Mr. O'Neil bid \$26,000. The appraised value of the plant was \$70,000.

A fine deposit of porcelain clay has been found on the farm of Mrs. M. L. Timberlake at Gwendale, I. T., and a representative of an eastern company has inspected it with a view of putting up a plant to develop it.

At the annual meeting of the Van Briggie Pottery Co., Denver, Colo., it was voted to increase the capital stock from \$75,000 to \$125,000. Mrs. A. Van Briggie was re-elected president, as well as all the old officers.

The National Porcelain Company, Trenton, N. J., has been incorporated with \$25,000 capital stock, by Samuel L. Dunkle, B. L. Dunkle and George F. Wycoff. The company will have a plant at North Feeder and Old Rose Streets.

The Patterson Foundry and Machine Co., East Liverpool, O., has been awarded the machinery for the new pottery, costing \$1,000,000 at Newell, W. Va., also the complete equipment for the Pfaeltzgraff Stoneware Co., at York, Pa.

The pottery concern at Colesburg, Ia., has been incorporated at the Galesburg Pottery Company with \$20,000 capital stock. J. F. Wilson of Council Bluffs is president, L. H. Langworthy of Dubuque vice president, and T. A. Foote of Colesburg manager and secretary.

The Homer Laughlin China Co., East Liverpool, Ohio, will take over and operate the new pottery which is being built at the new town of Newell, W. Va., across the Ohio River. The Laughlin plant will be operated by the Wells-Clark China Co., a new company, with W. E. Wells as president and George W. Clark secretary-treasurer. Both are now connected with the plant.

SAND OR LIME BRICK OR BLOCK NEWS.

J. L. Brazee of Omaha, Neb., will establish a cement brick plant at Oxford, Neb.

Leroy Haley and Maurice H. Whalen, Biddeford, Maine, will start in the cement brick business.

The Lamb & Rutledge Brick Co. has installed a sand brick plant near Hanover, O., making 25,000 brick per day.

The Porter-Wrigley Company, 1415 Empire Building, Atlanta, Ga., will establish a plant for the manufacture of sand brick.

The Plant City (Fla.) Granite Brick Co. wants a mill for the grinding of hydrated lime that will not require over 10 to 15 h. p. to operate.

The Casper (Wyoming) Cement Brick and Block Co. has been organized with \$6,000 capital stock. George W. Redmond is president and S. P. Laing secretary.

The sand lime brick factory of C. C. Warren, at Bainbridge, Ga., is nearly ready to be put into operation. Twenty thousand sand lime brick will be made daily.

The Sand Lime Brick and Artificial Stone Co., Denver, Colo., has been incorporated with \$10,000 capital stock by George B. Sutor, H. C. Barr and others of Denver.

The Hastings (Neb.) Pressed Brick Co. has its sand lime brick plant in full operation. They have thoroughly overhauled the plant and are now making good brick.

The Oldfield Cement Brick Corporation, Norfolk, Va., has been incorporated with \$50,000 capital stock. Chas. C. Cobb is president, J. B. McCaw, secretary and treasurer.

Seaboard Brick Co. has been organized at 419 Market street, Camden, N. J., with \$100,000 capital stock. Incorporators are: F. R. Hansell, John A. MacPeak and George B. Martin, all of above.

The Ida Grove (Ia.) Concrete Co. have ordered a full and complete outfit for making clay brick and tile. They also make concrete blocks and cement brick. The new improvements will cost \$15,000.

The Composite Pressed Brick Co., Portland, Oregon, has been incorporated with \$20,000 capital stock. Incorporators are F. A. Voertman, A. E. Drinker, William Brimmer, M. Van Alstine and E. J. Christie.

The Live Oak (Fla.) Brick and Supply Co. has been organized with \$25,000 capital to establish a sand lime brick plant. G. W. Canfield, 22 Hogan street, Jacksonville, is the engineer and F. H. Bremer is the manager.

The Indiana Sand Lime Brick Co., North Judson, Ind., at a recent directors' meeting decided to add another press, thus increasing the capacity of the plant one-third. The demand for their brick has been greater than they could supply.

The Brink Haven (O.) Silica Sand Co. has been incorporated under New Jersey laws with \$50,000 capital stock. They will install a plant for the manufacture of brick that will cost \$25,000. The incorporators are E. L. Kern and A. Muernberg, of Pittsburgh, Pa.

MISCELLANEOUS ITEMS.

A brick kiln is being constructed by Wardlaw & Price at Utica, Miss., and operations will begin soon.

W. L. Barker or S. D. Frazier, Carrizo Springs, Texas, will give information regarding starting a brick plant to any practical man.

Superintendent Brodman of the Peoria (Ill.) Workhouse figures on making nearly double the brick at the workhouse plant than they did last year.

The Alden Clay Products Co., Crandon, Wis., has been incorporated with \$50,000 capital stock by L. T. Crabtree, M. D. Keith and A. L. Crabtree.

The Standard Brick and Tile Co., Ltd., Winnipeg, Manitoba, has increased its capital stock from \$40,000 to \$200,000 and will increase the capacity of their yards.

The Northwestern Clay Mfg. Co., Griffin, Ill., has been incorporated with \$150,000 capital stock by Samuel B. Goucher, Samuel McAdoo and Jesse O. Freeman.

The Novelty Brick Works at Newcomerstown, O., are now running full blast on an order for a 1,000,000 brick to be used by the Pennsylvania Railway at Dennison, O., car shops.

The Independent Brick Co., 32 E. State St., Trenton, N. J., has been incorporated with \$150,000 capital stock. The incorporators are: John Maddock, Joseph Lacy and F. L. Hulme.

The Thomaston (Ala.) Brick Co. has been incorporated with \$5,000 capital stock by J. O. Clancey, W. H. Helton, C. B. Thomas, J. P. Anderson, J. L. Ballard and J. L. Ballard, Jr.

The Bayou Sara (La.) Brick Co. has been incorporated with \$12,000 capital. John F. Irvine is president, Dr. A. F. Barrow vice president, A. Schnebelen manager, J. R. Matthews treasurer.

The Phoenix Coal and Mining Co., Cornell, Ill., are considering the adding of a brick and tile plant to their coal properties. James J. Kelly, Rookery Building, Chicago, is the general manager of the company.

The Bickford Brick Co. has been incorporated at 127 Market street, Camden, N. J., with \$750,000 capital stock. Incorporators are: John J. Deery, F. L. Richardson of Philadelphia, and Wilfred B. Wolcott of Camden.

The Kipling Brick Co. has been organized at Mobile, Ala., with \$15,000 capital stock. The plant will be at Kipling. The incorporators are: D. T. Jett president, George M. Jett vice-president, J. T. Jett, treasurer and manager.

The Modern Roofing Tile Co., St. Louis, Mo., which has a plant at Prospect Hill, filed articles of incorporation with \$100,000 capital stock. John C. Sharp and L. G. Sharp of Chicago have 1,955 shares and E. C. Hoelsche of St. Louis, 40 shares.

The Myers Clay Mfg. Co.'s plant at Toronto, O., has been sold to John Kaul and Frank Oberkirch of St. Mary's, Pa., who will organize the Kaul-Oberkirch Company. The plant is an independent sewer pipe plant and cost the new owners \$215,000.

A. W. & E. B. Johnson are erecting a brick and tile plant at Granger, Wash.

A new brick yard is being installed at Quincy, Wash., by Mr. Cochran and associates.

The Business Men's Club at Waurika, Okla., is going after a brick yard for that place.

J. F. Slater of Avoca has his new tile factory at Kellogg, Ia., under way and moved his family to that town.

The Alsey (Ill.) Brick and Tile Co. has been formed with \$25,000 capital stock by Matt Hoot, Henry Pfenninger and G. B. Wills.

A party from Carey, Ohio, is about to locate a \$25,000 brick and tile plant at Mount Blanchard, O. Land has already been purchased.

The Oakland Brick and Tile Co., DeWitt, Ill., has been incorporated with \$10,000 capital stock by Joseph Mitchell, Fred Mitchell and C. E. Berry.

William Krombach of Keystone, Ia., is the new manager of the Davenport Brick and Tile Company's plant located at Buffalo, Ga. He will move to Davenport.

L. D. & C. C. Morris of Atlanta, Ga., will build a \$50,000 brick plant at Lock 3 on the Coosa River, where the Seaboard Air Line Railway crosses, 46 miles from Birmingham, Ala.

The South Bend (Ind.) Brick Co., which turned out 12 million brick last year will increase the capacity of its two yards 25 per cent this year. E. A. Morse is president of the company.

The Charles T. Hicks Clay Co., Drake Ill., has been incorporated with \$20,000 capital stock to manufacture clay products. Incorporators: Charles L. Hicks, W. S. Porter and J. C. McGrath.

Messrs. Leiby & Flurie, New Cumberland, Pa., are installing the "Martin" Latest Improved Syle "A" Steam Power Brick Machine in combination with Horizontal Pug Mill, and including Disintegrator, Elevators, etc.

The Stuyvesant (N. Y.) Brick Co. has been incorporated with \$50,000 capital stock. The directors are: John Scanlon of Cohoes, C. B. Shaffer, Fred H. Ferris, B. F. Smith, C. A. Howland and L. Shaffer of Mechanicsville.

The Lowe Brick Co., New Platz, New York, have bought from the Henry Martin Brick Machine Mfg. Co., Lancaster, Pa., a latest improved "Martin" Style "A" Steam Power Brick Machine fit up with Horizontal Pug Mill, and including Disintegrator, Elevator, Sander.

The Norwalk (O.) Brick and Stone Co. recently elected the following officers: George S. Stewart president, Ralph Mesnard vice president, E. S. Kinney secretary and treasurer, Herman Koester superintendent of brick yard, C. Kircher superintendent of stone yard.

The Brooklyn (N. Y.) Builders' Supply Co. has been incorporated with \$150,000 capital stock to manufacture brick, lime and cement. Incorporators are: Fred W. Rowe, E. Parkway and Brooklyn Ave., E. J. Maquire, 1302 Pacific St., and F. B. Morris, 188 Fennimore St., all of Brooklyn.

The Southern Lime & Cement Co., Charleston, S. C., want 5,000,000 building brick at Mobile, Ala.

The Edgar Allen Poe Brick Co., Fayette, N. C., has been incorporated with \$100,000 capital stock.

The Orange (Texas) Brick & Clay Mfg. Co., recently established by I. J. Mandeville is now ready for operation.

R. S. West, Talladega, Ala., has bought the Robinson Foundry plant and will convert it into a factory for making brick.

C. V. Svoboda and E. W. Gruber, brick manufacturers at Ord, Neb., have dissolved partnership and Mr. Gruber will continue the business.

The Gold Bros. Brick Co., Big Stone, S. Dak., have placed an order for a complete plant to make dry pressed brick that will cost \$7,000.

The Capital Paving Brick Co., Springfield, Ills., has been incorporated with \$20,000 capital stock by Joseph Mester, Henry Mester and Harry Hoyt.

The Jacklan Press Brick Co., Augusta, Ga., has been incorporated with \$25,000 capital stock to take over and operate the plant of Jackson & Phelan.

J. M. McEwen & Sons, R. F. D. No. 19, Matthews, N. C., who have been operating a sawmill will install machinery for manufacturing brick. Contracts are let.

The United States Sewer Pipe Co., Irondale, Ohio, has been incorporated with \$150,000 capital stock by J. Oscar Naylor, John A. Huston, C. L. Williams and H. J. May.

T. K. Hamilton of Leavenworth, Kansas, L. P. Worden and Ben. A. Wood of Syracuse, Kansas, are contemplating the putting in of a dry pressed brick plant at the latter place.

The Columbus & Hocking Clay Construction Co. has been incorporated in Ohio with \$100,000 capital stock by David Paine, Clarence D. Kerr and J. M. Hartfield, all of 31 Nassau St., New York.

The Paxton Brick Co., Paxtonville, Pa., has been organized by W. W. Swengle and others, and will make brick using the water power of Middle creek securing several hundred horse power if necessary.

L. E. Fitch, who intended joining a company to build cement building material at Worthington, Minn., has decided to go into the tile business instead, and will furnish tile for the farmers of Nobles county.

Capt. John N. Porter has purchased the Ohio River Clay Co.'s brick works from Park Bros., at Kenilworth (P. O. Congo), W. Va., and will put the plant in operation. Capt. Porter will rebuild the plant on a much larger scale.

The Milwaukee (Oregon) Pressed Brick Company has been organized and will make an investment of \$30,000. They have bought a tract of land on the Willamette River and will have both rail and water transportation facilities.

The Birks Clay Co., 428 Market St., Camden, N. J., has been incorporated with \$100,000 capital stock. Incorporators are William E. Decker of Camden, Edmund E. Wade of Blandon, Pa. and Imiah H. Green of Philadelphia, Pa. The plant will be near Blandon, Berks Co., Pa.

A fire brick works has been erected at Girard, Ala., by A. L. Crawford.

E. W. Redman has purchased the brick and tile business of D. C. Gibbs at Ithaca, Mich.

M. D. Funk and William Jordan have purchased the Wray (Colo.) Brick Works from J. B. Beckwith.

The Corbin (Ky.) Brick Co. has been incorporated with \$5,000 capital stock and work started on a factory.

Frank F. Bentley of Niles, Ohio, has been granted a brick pallet. It is what is known as a Bench pallet.

The Conococheague Brick Co., Williamsport, Md., has installed a new dry press brick machine in their plant.

The Red Star Brick Co., Jamestown, N. Y., recently received an order from the Brooks Locomotive Works for 4,000,000 brick.

The Colorado Brick Mfg. Co., Denver, Colo., has been incorporated with \$60,000 capital stock by Ben Brewer, Oscar D. Cass and Samuel B. Colburn.

The Liberty (Kansas) Light & Heating Co. will be organized and a \$35,000 brick plant will be built, utilizing the gas from a number of wells owned by the company.

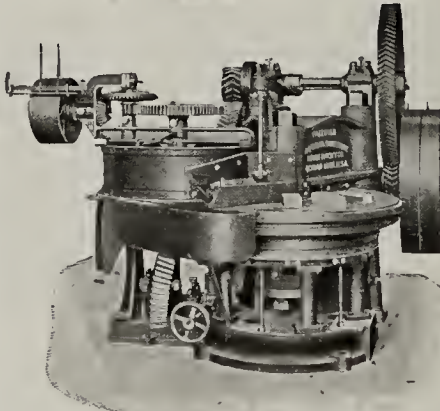
J. H. Thompson and Wm. Schmidt have formed a partnership under the name of Eland Brick Co. and will build a brick works south of the village of Birnamwood, Wis.

The Rensselaer (N. Y.) Brick Co. has been incorporated with \$25,000 capital stock, by C. J. Smith, R. H. Rollins and H. L. Brayton of Rensselaer, and G. J. Hatt of Albany.

The Farmers' Protective Association, Pomeroy, Ia., has been organized and a committee appointed to look up the building of a brick and tile factory. Alex. Peterson is president.

The Hocking Valley Brick & Terra Cotta Co., Columbus, O., has been incorporated with \$300,000 capital stock by S. J. Heafield, S. L. Douglas, Chas. L. Baird, John C. Baird and Franklin Rubrecht.

The Pacific Mfg. & Supply Ass'n, San Pedro, Calif., has been organized with \$25,000 capital stock and has acquired the old Alexander brick plant and will improve it. A. P. Peri is president and Phillip Gaffey, secretary and treasurer.



**The American
Sandstone Brick
Machinery Co.**

Saginaw, Mich.

One of these presses made 22M. brick each consecutive day of ten hours for more than six months without a breakdown. Another press made 4,235,000 the first ten months, ten hours per day run; is now making 35M. per day, day and night run. We were the first to introduce the Komnick or hydrated lime system in the United States; also to build and install the complete plant and guarantee results, and are prepared to furnish complete or partial installation.

Albert Curtis has bought and will operate the old Jaehnig brick works at Reed City, Mich.

The Raleigh (N. C.) Press Brick Co. has been organized by T. T. Hay and others.

The Canton (O.) Hollow Block Co. has increased its capital stock from \$50,000 to \$100,000.

J. Fred Binder of Emans, Pa., has entered into partnership with Wm. F. Stimmel in the manufacture of brick at Kutztown.

The Montrief-Earnest Vitriified Brick Works at El Reno, Okla., was destroyed by fire, causing a loss of \$20,000, no insurance.

Val. Holtz & Son, Grangeville, Idaho, are making extensive improvements at their brick yard in order to fill the large orders accumulated.

The Carthage (Texas) Brick Co. has been incorporated with \$10,000 capital stock by T. J. Frazer, Jasper Collins and J. W. Cooke, all of Carthage.

The C. J. Thornton Brick plant, located beyond the city limits at Vicksburg, Miss., has been destroyed by fire. The loss is \$2,000. Insurance, \$5,000.

Huber Bros. & Wildman of Blair have bought land at Gotebo, Okla., and have purchased the granite brick plant machinery and will install it at Gotebo.

The Schuylkill Pressed Brick Co., Schuylkill Haven, Pa., has been incorporated with \$10,000 capital stock and a plant will be started on the Imboden farm.

D. D. Olds, Walter M. Olive and J. R. Taylor have bought the brick yard owned by Dexter & Son at Wenatchee, Wash., and will operate it at full capacity.

Lowatsch & Latz, Kingston, N. Y., have incorporated to engage in the manufacture of brick below their mill on the Wilbur road. The plant will be started by June 15th.

The Walkers Mills (Pa.) Stone & Brick Co. has been incorporated with \$90,000 capital stock. Directors are James A. Ewing, Ernesto Bisi of Ewingsville and G. P. F. Wilhelm of Carnegie.

The Dunbar (Pa.) Fire Brick Co. now have their machinery in place and a temporary shed constructed so that they can make brick while they are rebuilding the plant which was recently destroyed by fire.

BUILDING SUPPLIES WANTED

The wonderful progress of Northwest and Western Canada has created a tremendous demand at

WINNEPEG

for all classes of Building Material. We reach every Architect, Builder, Contractor and Engineer in Northwestern and Western Canada. We reach every Brick Yard and Clay Worker. Write us for full particulars, etc.

WESTERN CANADA CONTRACTOR
720 Union Bank, WINNIPEG, CANADA.

A RARE OPPORTUNITY.

One thousand acres of "Fire Clay" with lignite coal in abundance on adjoining land. Clay of the following analysis with a vein running from four to forty feet. Some of it shows the same analysis, except has much less sand.

ANALYSIS:

Telephone Connection.

CHEMICAL LABORATORY,

H. ENDEMAN, PH. D.,

Analysis, Consultations and Researches.

23 William Street, New York, Aug. 9, 1904.

CERTIFICATE OF ANALYSIS.

For F. M. Greene, Atlanta, Texas.

I have examined the sample of Clay marked as stated below and find the following results:

It contains in 100 parts by weight—

Alumina.....	19.88	CLAY
Silica.....	20.95	
Hydrate water.....	6.03	
Oxide of iron.....	0.74	
Alkaline earths and alkalies.....	2.22	SAND
Coarse sand (sample.....)	35.00	
Dust sand.....	15.18	

This clay situated in Texas. Would like to put it in as stock with good people to develop it. Samples and full particulars on application.

F. M. GREENE, ATLANTA, TEXAS.

The Chicago Fire Brick Co., Chamber of Commerce, Chicago, has increased its capital stock to \$30,000.

Bennett & Smith, Gleason, Tenn., are putting in a new up-to-date brick yard. They will operate same by a gasoline engine.

The brick yards of the late Daniel Robinson, Chester, Pa., have been leased by Wm. J. McClure, Jr. and William T. Vernon of Marens Hook.

Capt. Adam Buch and John W. Snyder have purchased land at Portsmouth, O., and intend to form a company to engage in the paving brick trade. Mr. Snyder is secretary and treasurer of the Portsmouth Banking Co.

LOCATIONS FOR NEW INDUSTRIES

can be secured on the lines of the

Chicago, Milwaukee & St. Paul Railway

in the great middle west. It reaches the Copper Country and the pine and hardwood acres of Northern Michigan, the lead, zinc and iron regions of Wisconsin, the coal fields of Illinois, Iowa and Missouri.

Traverses the great agricultural and manufacturing states of Iowa, Minnesota, North and South Dakota. Operates 7,000 miles of thoroughly equipped railroad.

Correspondence is solicited with eastern manufacturers who desire to move their factories to, or establish branches in the West. Co-operation with Business Men's Associations on the lines of this railway in all matters affecting mutual interests is assured.

Inquires should be as definite as possible.

Address

Industrial Department

Chicago, Milwaukee & St. Paul Railway

Room 1327, Railway Exchange
Chicago

CLAY RECORD.

CLAY LAND FOR SALE.

74 acres. Samples, pavers and sewer pipe, made from this clay, shows in all official tests equal to the standard pavers. Bed located on railroad and Erie canal, seven miles from Syracuse, N. Y. This city is to spend over a million dollars in sewerage. Property is sold on guarantee to make a No. 1 paver and sewer pipe. Terms easy.

HENRY LOFTIE,
216 Burnett Ave., Syracuse, N. Y.

FOR SALE.

An interest in my tile and brick plant, to one of experience, that can take charge and run it. Must be able to invest some money in plant. Plenty of good clay at back door, and good market at front door. This is an opportunity that you don't often run up against. Plant now running. Come and see or write

S. H. RECORD,
Charleston, Ill.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

Profitable running brick plant, 25,000 capacity. Ready sale for entire product. Owner has larger interests requiring attention.

TERRA HAUTE PRESSED BRICK CO.
Terra Haute, Ind.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address

T, care Clay Record,
Chicago, Ill.

BRICK YARD FOR SALE IN GAS BELT.

A fine brick yard for sale. Dry Press. Everything new last year. Five up-draft kilns. Making money. Fine shale bank. Can make brick cheaper than any yard in Kansas. Reason for selling one of the partners has large oil interests in Indian Territory. Will give time on part of price. Making 30,000 brick daily and ready sale. Address

A. B., care Clay Record,
Chicago, Ill.

FOR SALE.

A second-hand Four-Mold Dry Press. Has not been used more than a year. Good condition of repair guaranteed. Also good second-hand 44-inch Pulverizer. Address

BOSTON,
Care Clay Record, Chicago, Ill.

POSITION WANTED.

Wanted, position as foreman or manager of a Dry Press Brick Plant of not less than 20,000 brick per day. A number of years experience. Address

ELLIS,
Care Clay Record, Chicago, Ill.

FOR SALE.

Chambers End Cut Brick Machine, capacity 3,500 brick daily. 75 double deck roller bearing stiff mud brick cars.

STEELTON & HARRISBURG BRICK CO.
Steelton, Pa.

PARTNER WANTED.

A good, reliable man of experience, with some capital to invest in and take charge of a new Dry Press Brick Plant. Plenty of shale, and good market for all the brick. Address

DENIS, care Clay Record,
Chicago, Ill.

WANTED.

A man who understands brick making in all its branches, and who has \$5,000 to \$10,000 to buy an interest in a large brick plant in the West, and take complete charge of same at a good salary. Plenty of business at good prices; no competition. Owner has other business and wants some one interested who can run the plant. Address,

"West," Care Clay Record, Chicago.

Machinery For Sale.

FOR SALE.

50 rack oars for 32 inch pallets, capacity 432 brick; track gauge 24 inches.
Also 55 flat cars for soft mud brick, with foot pallets Track gauge 25 inches.

Both styles of cars in first-class repair.
ATLAS CAR & MFG. CO.
Cleveland, Ohio

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine.
Address "GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.

THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets.
10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new.
DEALER,
Care Clay Record, Chicago, Ill.

MACHINERY WANTED.

Second-hand 9-foot dry pan, screens, elevators, pug mill, large size Chambers' brick machine, belting, pulleys, cable and dump cars. Also 150 to 250 h. p. Corliss engine, and two 100 h. p. boilers.

J. O. C., care Clay Record, Chicago.

FOR SALE.

A brick and Tile plant, equipped with up-to-date machinery, 60,000 daily capacity, down draft kilns, inexhaustible bed of best clay suitable for all kinds of building, facing and paving brick, drain, tile, sewer pipe, etc., on two railroads, demand very good. Address

B, care of Clay Record.

FOR SALE.

A going, money-making hollow block plant. Best location in Ohio. Also well equipped for face, common, paving and common brick. Includes coal mine and 125 acres of four foot Cambridge coal, overlaid with shale and underlaid with fire clay. Good prices and more orders than can be filled. Plant comparatively new and in excellent condition. Will be sold at \$40,000, two-thirds original cost, one-half cash and one-half credit. Good reason for selling. Address,

THE GUERNSEY BRICK & CONSTRUCTION CO.
Cambridge, Ohio.

FOR SALE.

2,000 ft. 12-lb. steel rails, used one season.
11,000 32-in. x 9 1/4-in. No. 1 White Pine Pallets.
One set Brick Moulds, new, 9 x 4 1/4 x 2 1/8 inches.
One 48-in. Leviathan Belt for Potts' Sander, new.
One Potts' Dump Table, used one season.

RIVERSIDE BRICK CO.
Green Bay, Wis.

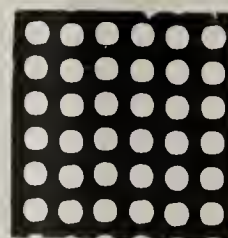
FOR SALE OR TRADE.

One Standard Brick Machine, steam power, 30,000 capacity. 24 new Brick Moulds. 11,000 Pallets. Three Off-Bearing Trucks. All in first-class condition. Owner, E. J. SWARTZ & SON,

Syracuse, Ind.

FOR SALE.

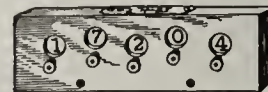
One Model "B" Four-Mould Dry Press, used only a short time, thoroughly overhauled.
Model B, care Clay Record, Chicago.



PERFORATED METALS

for all purposes
Prompt shipment of all orders guaranteed.

H. S. SIMPSON,
817 Chamber of Commerce
Chicago, Ill.



Paper Joggers quoted.

R. A. HART, 41 White St.,

No better made, cut from \$3 and \$10, to

4 Wheel, \$3.00

5 Wheel, \$3.25

Guaranteed.

Sold by all dealers

BATTLE CREEK, MICH

FOR SALE CHEAP.

First-class brick and tile plant. Good machinery. unlimited clay supply, 25,000 capacity daily, 8 kilns 170,000 capacity, dry sheds, etc. Track connections, A snap if taken at once. Address

H. C. MODLIN, Secretary,
Perry, Iowa.

ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

FIRE CLAY LANDS.

500 acres underlaid with heavy vein superior fire clay and light vein coal, which can be mined cheaply, on the line of the N. Y. C. & H. R. R. R., in Pennsylvania, for lease on royalty at low price per ton. For further information address the owner.

BOX No. 308, Williamsport, Pa.

FOR SALE OR EXCHANGE.

One of the best small brick and tile plants in Southern Michigan. 20,000 capacity, Stewart patent kilns, good drying sheds, all machinery in first-class condition, fine clay, good market. Will sell at a bargain or will exchange for good real estate.

Address,
MICHIGAN,
Care Clay Record, Chicago

STEAM SHOVEL FOR SALE.

Barnhart style "R," good condition, large enough to dig clay for 100,000 brick in 8 hours. Apply to
ILLINOIS BRICK COMPANY,
918 Chamber of Commerce,
Chicago.

FOR SALE.

One 5-ft. Style American Dry Pan, practically new.
One 10-hp. Gasoline Engine, complete.
KIAMENSI CLAY CO.
Newport, Del.

9-FT. DRY PAN WANTED.

We could use another Dry Pan and will buy at once if good and cheap. Will buy 25,000 capacity Stiff Mud Machine and Pug Mill and Dunlop Screen.
GOETZ PRESSED BRICK CO.
New Albany, Ind.

SETTER WANTED.

A first-class brick setter. State age, experience, reference and salary expected.
Box M, Neshkoro, Wis.

SAND LIME PLANT.

Huennekes System Plant, including best Four-Mould Boyd Press, Jeffrey Sand Dryer and Conveyor; all practically new and in good condition; will be sold at less than half of construction cost. Address, SAGINAW PRESSED BRICK CO.
Saginaw Mich.

FRANK TOOMEY

127 and 131 North Third Street.
PHILADELPHIA, PA.

Great Assortment, 3,200 Pieces.	ENGINES, CORLISS. Automatic. Steam	Slide Valve, Pumps, Dynamos, General Machinery of all kinds Rebuilt and Guaranteed. Immediate Delivery. Send for List of Stock
--	---	---

Brick and Mortar Coloring

After twenty years "Clinton" colors still stand at the head. Get the genuine, with the "Little Yellow Side-Label."

CLINTON METALLIC PAINT CO., Clinton, N. Y.
CORRESPONDENCE SOLICITED.

WARNING

NOTICE is hereby given that the process of drying and burning brick by first setting green, undried brick in horizontal courses in a kiln to form a layer thereof, then covering and drying such layer, and successively coursing, capping and drying separate layers of green, undried brick upon the last dried layer until all the layers are thoroughly dried, and then burning, is patented in U. S. Letter Patent No. 485199 to J. C. Kenzel, dated Nov. 1, 1892, and all persons are hereby warned against using such processes without grant or license from the undersigned owners of said patent. Unauthorized use of the patented process will render the user liable to an action for infringement and the payment of damages to the owners of the patent, whose rights thereunder will be strictly enforced.

J. C. KENZEL,
J. S. KRAUSS,

P. O. Box 271.

128 Logan St., Knoxville, Tenn.

The Burlington Route

calls attention to manufacturers seeking a new location to its Industrial Department. This department is established for the benefit of manufacturers. Information on the three Rs of manufacturing—Power, Raw Material, Market—can be had by writing



W. H. MANSS,

Industrial Commissioner,

209 Adams St., CHICAGO.

CLAY RECORD IS A SEMI-MONTHLY

NOW READY—A TREATISE ON

PRODUCER-GAS and GAS-PRODUCERS

BY AN ACKNOWLEDGED AUTHORITY.

A 300-page book containing thirty chapters, giving the fundamental principles and definitions, calculations, classifications, manufacture and use; the fuel, the requirements, the history, its by-products, **Producer-Gas** for firing kilns, steam boilers, and power plants. The future of the Gas-producer and a bibliography.

OVER 100 CHOICE ILLUSTRATIONS—PRICE, \$4.00.

A subscription to the CLAY RECORD for one year without additional charge to those that are not now subscribers.

CLAY RECORD PUBLISHING COMPANY

CHICAGO, ILL.

Refractory Cement

(So called because it is worked the same as cement)

A high refractory composition that can be used the same as cement, cured and put to use in twelve to twenty-four hours, and will endure any degree of heat that fire-clay products will.

Applied to the inside of a kiln it will protect the walls and give increased refractivity; will reduce the cost of repair, and save fuel in any kiln.

Every boiler furnace should be lined inside with "Refractory Concrete." It will protect the walls and increase the heating capacity by preventing radiation.

For insulating steam pipes this composition is guaranteed equal to asbestos or magnesia felt; the cost per foot to cover a 3-inch to the thickness of 1 inch will be 4c.

Refractory brick of a high order can be formed from the composition on any cement brick machine.

For flue linings, chimney blocks and tops, floor and partition blocks, conduits for electric wires, etc., this is the ideal material.

Refractory Concrete can be combined with any aggregate used in the formation of cement products.

For information pertaining to your particular requirement, and prices, address.

E. R. STOWELL

NEW CORYDON, INDIANA

**A NEW CLAY FEEDER AND MIXER**

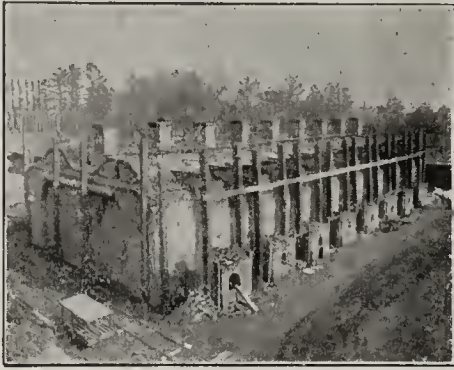
The Rust Clay Feeder has been brought out in response to a better method for mixing and feeding clay in brick, tile and all clay working plants. By the use of this feeder the services of two men are entirely dispensed with, the clay being dumped into hopper of machine from car is automatically fed into the disintegrator. The spirals draw their supply evenly from all parts of the hopper, mixing the clay perfectly, which tends both to improve and increase the output of the plant.

Send for full descriptive circular.

Marion Machine, Foundry and Supply Co.

Marion, Ind.

Something New In Brick Kilns and Dryers



The Dennis Double Chamber Up and Down Draft Brick Kilns and Direct Heat and Hot Air Brick Dryers show many new features that make them superior to all others. Economical, durable and strong in construction and operation, having many points of advantage that appeal to practical brick-makers. Patented April 14, 1903 and September 8, 1903. Brick plants installed and put in operation. Write for booklet. Correspondence solicited.

F. W. DENNIS,
145 Water St., Norfolk, Va.

Robert F. Wentz, M. W. S. E.

701 National Bank Building, Allentown, Pa.

DESIGNER AND BUILDER OF

Cement and Sand-Lime Brick Plants, Analysis, Tests, Examinations, Reports, Preliminary Plans, Estimates and Complete Drawings and Specifications for Modern Cement and Sand Lime Brick Works.

We have designed, built and reconstructed twenty-two Cement Plants in the past twenty years.

We design and equip complete Cement and Sand-Lime Brick Plants with the most modern machinery.

THE HYDRO - MALAXATOR PROCESS for the manufacture of Sand-Lime Brick.

Absolutely safe and reliable. Ask your friends

A WOODEN TOWER

Is a source of annoyance and danger. It is liable to rot and collapse at any time. A

CALDWELL STEEL TOWER

is safe, staunch and durable and will carry four times the weight of the filled tank. Expensive labor is not necessary to erect these outfits, your own men can do it. We furnish all plans.

Send for illustrated catalogue and price list.

W. E. CALDWELL CO., Louisville, Ky.

How to Use Portland Cement.

From the German of L. Golinelli.

Translated by Spencer B. Newberry, E. M., Ph. D.

A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.

22,000 copies sold in Germany.

Portland Cement Sidewalk Construction.

Compiled by P. B. Beery, and based upon the experience of many successful contractors.

A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.



FIRE! FIRE!! FIRE!!!

THE "CHILDS"
FIRE EXTINGUISHERS
APPROVED

and included in the list of approved extinguishers issued by the

National Fire Protection Association

SALESMEN WANTED

O. J. CHILDS CO.

Sole Mfrs.

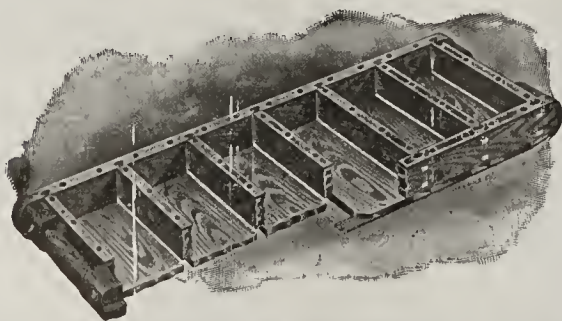
UTICA, N. Y.

Brick Moulds and Brick Barrows

With Moulds and Barrows it is not the first cost, but it is, will they last? We have made them for over 30 years and know your wants. All kinds and shapes. A trial order will convince.

James B. Crowell & Son,
Wallkill, N. Y.

PERFECTION BRICK MOULDS



These are the kind of Brick Moulds the Brick Makers have always wanted but could not get till now. You can get a mould that the vents are right all the time. No change whether the Mould is wet or dry. Try a sample order. Satisfaction guaranteed.

PATENTED JAN. 28, 1902.

THE ARNOLD-GREAGER CO.
NEW LONDON, OHIO.

Manufacturers of Brick Machinery and Supplies of all Kinds.

H. M. DEAVITT,

PRACTICAL AND CONSULTING CHEMIST,

Garden City Block,

CHICAGO.

Analyses of Clay, Sand, Lime, Cement Materials and Shales a specialty.

Special attention given to the preparation of Clay Products from the raw material.

A well equipped laboratory and long experience in this branch of work enables us to give expert reports on obtaining glazes on refractory materials.

All enquiries in regard to the above will receive prompt attention.



Vol. XXVIII. No. 9.

CHICAGO, MAY 15, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

ÆSTHETIC POSSIBILITIES IN THE USE OF CLAY PRODUCTS IN ARCHITECTURE.*†

By James M. White, Professor of Architectural Engineering,
University of Illinois.

I am very glad to present this subject because it touches the relation between the manufacturer and the architect, and probably few of you realize how dependent the architect is on the manufac-

others because of their artistic merit, and in some instances fashion plays an important part. Cost alone is becoming less frequently the controlling element, and the salesman must be prepared to exploit the strength and durability of his materials and to show certificates from testing laboratories in proof of his statements; he must be able to discuss its aesthetic possibilities, for the results often depend more upon a proper combination with other materials than upon what can be seen in the sample itself. There never can



I. Marble Columns and Rich Terra Cotta Ornamentation, Pavia, Italy.

turer for his success or how valuable the support of the architects may be to you.

Some building materials find a market because of their durability,

*Delivered at the 28th annual meeting of the Illinois Clayworkers' Association, held at Champaign, Jan. 23-24-25, 1906.

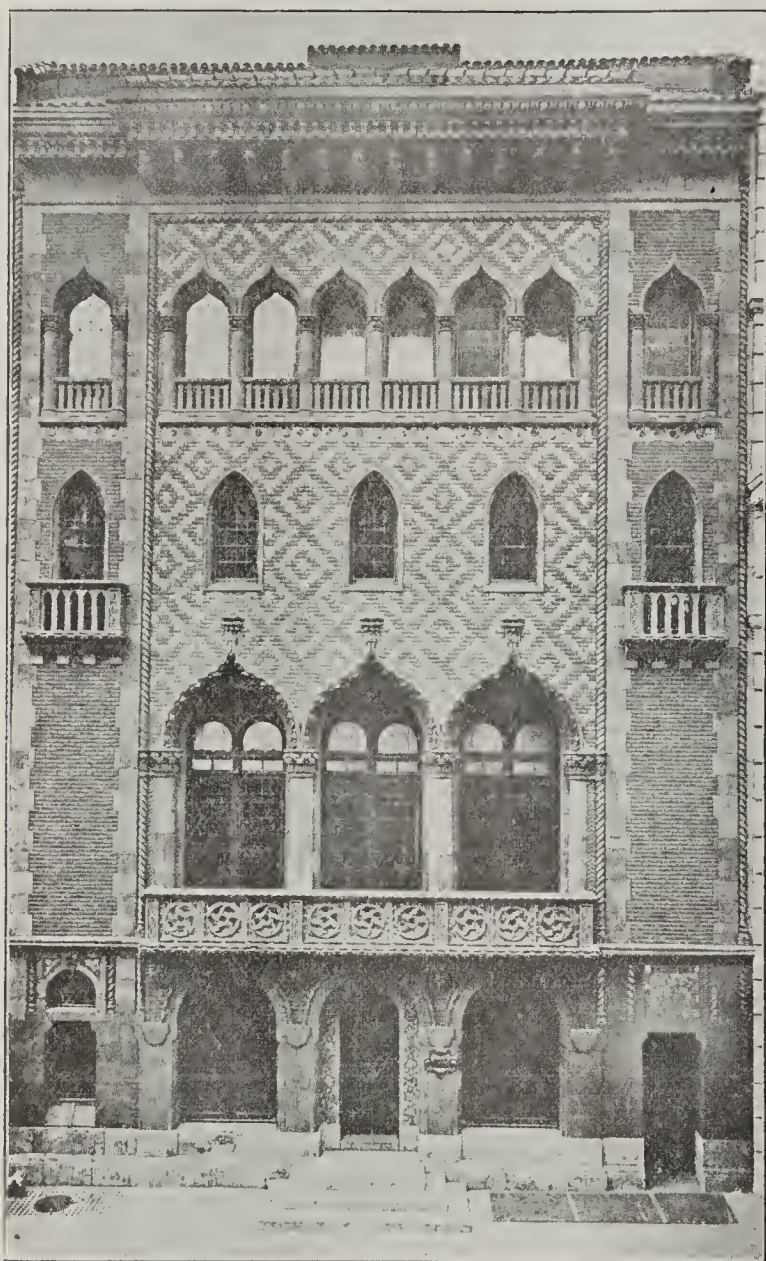
†Illustrated by lantern slides.

be any absolute criterion by which to judge the artistic merit of a brick or a tile, but there is a way to employ almost anything so as to get artistic results, and it will pay every manufacturer to know how such results are to be obtained with his product.

The editor of *The Brickbuilder* says editorially in January, 1897,

that "it is a melancholy and somewhat humiliating fact that under existing conditions the quality of brickwork is—all things considered—probably worse in America than in any other civilized country, while the quality of bricks is often better than elsewhere." With the introduction of the fine grades of bricks we have developed a love of fine joints which are so thin as to be of no use constructively, which rob the work of all character and gives to it a hard, dry, sleek appearance which can appeal to no artistic instinct. Until quite recently the ideal of an exterior brick wall was one with even and hardly visible joining and with a uniformity of color which produced a surface absolutely devoid of character or interest and without the charm of color, which comes naturally and inevitably where bricks are used without culling and are laid with joints sufficiently wide to tell in the color scheme. Brickwork to

place of the insipid stretched work which was invariable twenty years ago. Owing, however to the fact that common bricks in this country are rarely made, as they ought to be, so that two headers with the intermediate joint will be just equal to a stretcher, it is difficult and expensive to make use of these bonds. The width of the brick



II. The Wetzel Building, East Forty-fourth Street, New York.

invite attention must be unconventional in treatment, and of late our architects have been learning the beauty of color variety in brick, and the value of the jointing as an element in the color and texture of the wall, and these walls of monotonous sameness have become less common. The first departure from the ordinary red was a gray buff, which was put on the market about 1863, and used to easily bring sixty dollars per thousand. At the present time we can get white, buff, red, gray, brown, old gold, mottled, and all the intermediate shades of brick, but with all this variety they are often laid without culling, as they ought always to be.

The greater effectiveness and interest given to the appearance of a brick wall surface by the true English and Flemish bonds has also come to be appreciated, and these are more and more used in



III. A Building Designed on Medieval Traditions at Bologna, Italy.

in relation to its length is usually too short, and the result is that the strongest of these two bonds, the true English bond with alternate courses of headers and stretchers, can rarely be made use of without cutting the brick to avoid the vertical joints coming over



IV. A Modern Brick and Terra Cotta Building, Bologna, Italy.

each other to the detriment of strength as well as appearance. For this reason the Flemish bond is more often employed; but even in this bond the headers can be brought over each other only with considerable pains. Some communities have tried to remedy the

defect by legislation, and the following bill, which was submitted to the legislature of Massachusetts, indicates a size which would give satisfactory results:

Section 1. From the first day of July of the year nineteen hundred and three, all bricks manufactured or sold in this commonwealth shall be known as standards or seconds.

Section 2. The size of standard face bricks shall be eight and three-eighths by four and one-eighth by two and one-fourth inches, and the size of standard common bricks shall be eight and one-fourth by four by two and one-fourth inches.

Section 3. All bricks not of standard size shall be seconds.

From some recently published articles on brickwork I have abstracted the following descriptions to show by what combinations some architects have striven to avoid monotonous uniformity without having to await the weathering effect of years:

Red brick laid without sorting for color and with deep concave joints.

As a single instance of modern English work, I cite Westminster Cathedral, which is one of the remarkable recent buildings in London, and as it is a very artistic structure built to stand for centuries it is of interest to note the materials selected: "For the exterior Bracknell red facing bricks two inches thick were used, with wire-cut bricks for the piers, and hard blue bricks for the outside facing of the underground vaults and sacristy and for the damp-courses, set in nearly neat cement. English bond was generally adopted, except for the outer facing, which was bonded to the backing with one course of binders to four of stretchers, without the use of quarter bats. Inside the building stock bricks were employed. The mortar was composed of Portland cement and clean sharp Thames sand, mixed in the proportion of one to three. The courses were well rubbed in and flushed up as work proceeded, with a good substantial mortar joint throughout. The blue bricks will sustain a pressure of seven hundred tons per square foot, and are impervious to moisture."



V. Terra Cotta Ornamentation on Hospital at Milan, Italy.

A speckled red brick laid on its face in black mortar.

Mottled gray brick in white mortar with red shingle tile roof.

Cream colored brickwork in white mortar with trimmings of glazed white terra cotta.

Roman bricks, almost orange tan in mass, but full of variety in shading and texture, with a shingle tile roof of a dull salmon pink.

Bands of light pinkish red bricks and ivory toned terra cotta in gray white mortar.

Pinkish sand mould brick with grayish headers laid in white mortar.

Red sand mould brick with black headers laid in black mortar.

Red sand mould brick laid in Flemish bond with about one-third of the headers vitrified and of a soft gray color such as are found in wood-burnt kilns.

While we are advancing rapidly in our appreciation of the possibilities of brickwork the great opportunities for the artistic use of tile are scarcely appreciated even by the average architect, and others are not bold enough to follow their inclination to employ them for fear that the result will be so unusual and striking as to cause comment. This is much to be regretted, since with tiles, whether upon the roof proper or upon the sides of the building, very many rational and natural artistic effects are possible. There are three general methods by which such artistic results may be obtained: first, by the color or combination of colors; second, by the shape of the tile; and third, by the combination of tiles of different shapes and colors into groups or patterns. As a matter of fact, none of these three methods are new, but have been employed by architects of all countries for many centuries, and are still full of possibilities.

The first consideration is that of color, and all the other artistic possibilities of tile are of secondary importance. The flat, dead, absolutely even tone that one frequently sees throughout an entire building, indicating that great care has been taken to select brick, terra cotta trimmings, and roof tile of the same identical color, is a lasting monument to a lost opportunity. The old tile roofs of Europe, generally so beautiful and harmonious in color as to have often called forth praise, are types to be well considered. It is practically impossible to find one of them of even shade throughout, and though the variations upon the same roof are extreme, the result is almost invariably artistic. The color possibilities of tile are almost limitless and therefore nothing need be crude or harsh. All the shades of brick are feasible and, when in addition the results of glazing are included with all its attendant hues and special effects the combinations become innumerable.



VI. Terra Cotta Details in the City Museum at Bologna, Italy.

Colored tiles which give flowing lines on a roof have greater possibilities than any other roofing material, but a certain amount of irregularity is an added element of charm, and I wish we had mechanics with enough of the artistic sense so that they could be permitted to vary a little from the chalk line and the square. A roof that is absolutely uniform in line and color is monotonous even though the light and shade effect on each tile is all that could be desired.

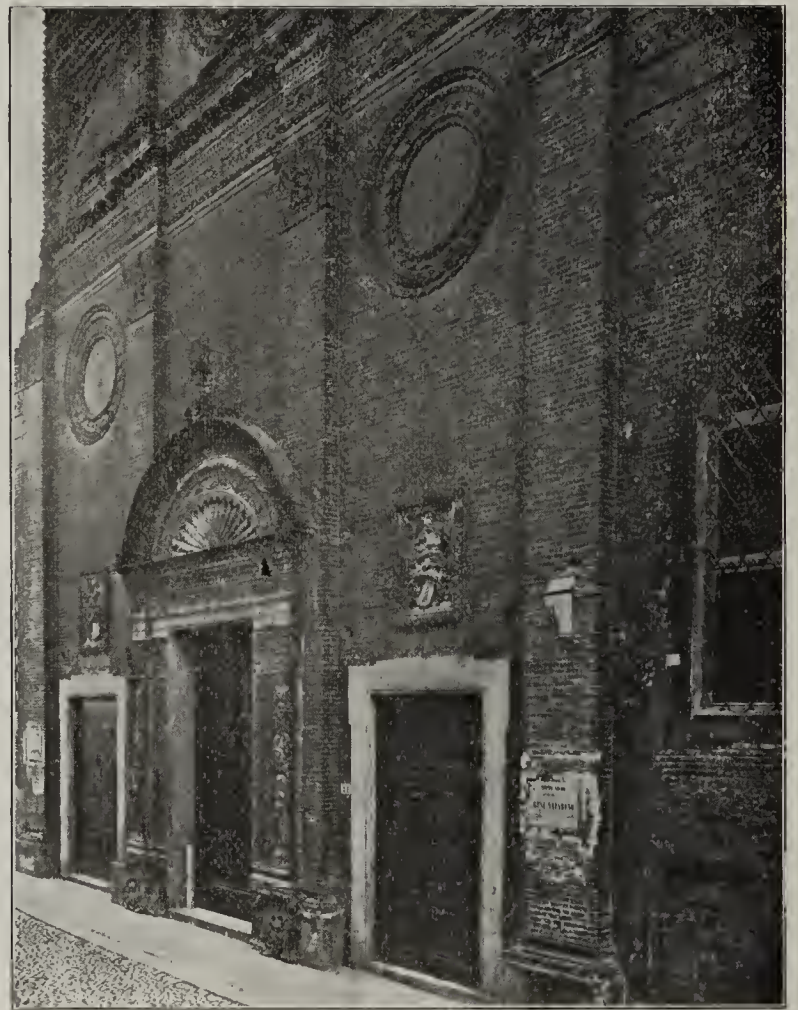
No hard and fast rule can be laid down for color combinations, and the extraordinary range and fine gradations of color that have been produced of late years seem to have added an element of danger to an already doubtful situation.

In selecting colors architects sometimes mislead themselves by placing small tablets of brick, terra cotta and tile side by side on an office table. In this they are liable to forget that any of these colors when seen in the mass at a distance under other conditions

of light may produce an effect that will prove quite disappointing. They are likewise misled at times by specially prepared "samples," or such as have not been taken at random from a purely commercial output.



VII. A Modern Brick and Terra Cotta Building at Bologna, Italy.

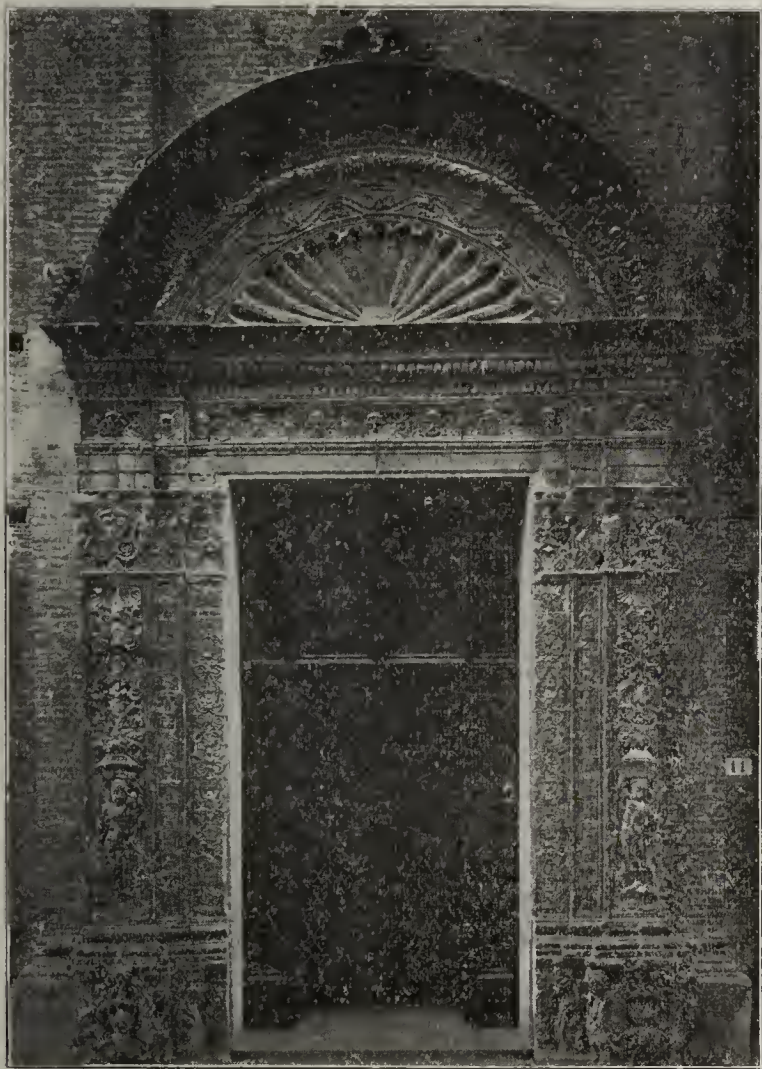


VIII. An Old Brick and Terra Cotta Church at Bologna, Italy.

Perhaps the safest, certainly the least expensive, test will be found in a critical inspection of current work on which others may have experimented with more or less success.

Whether terra cotta should be made to match the brick used in connection with it, or to stand out in contrast with its setting, often becomes a subject of debate. The question is one that can not be settled without reference to the style and character of the building, its situation and surroundings. These are the governing factors on which an intelligent decision must be based. The same æsthetic considerations should be applied to the use of terra cotta as to stone, but unfortunately terra cotta is still suffering from the stigma of being a cheap material and is not given the same chance that would be accorded to stone.

The good artist in brick values properly the use of molded brick and terra cotta and uses them whenever he can do so safely and artistically. The bad artist seems to rejoice in the endless profusion of ornament with which the cheap reproduction of molded forms supplies him.



IX. An Ancient Terra Cotta Doorway at Bologna, Italy.

PERUZZI'S TOWER, SIENNA.

Description by W. P. P. Longfellow.

Every detail is in brick; there is not a line or scrap of stone or of terra cotta in the whole. Even of molded bricks the forms are few, very simple, and very sparingly used; there are only the cymatiums of the cornices, a quarter-round and a cavetto for their bed moldings, the echinuses of the quasi-Doric capitals, and apparently—I am not quite sure of this—their neck moldings. All the rest is of plain, square-edged brick, yet the design is neither bald nor rude, nor yet inarticulate. All desirable detail is there; the proportion is so finely adjusted, the relief so delicate and yet so firm, the emphasis so well bestowed, that the tower has the effect of a finely treated design in wrought stone, and an air of elegance which it is very rare to find in pure brickwork.

The cupola is adjusted to the tower with admirable grace. It is a low octagonal cupola, a little less in diameter than the square shaft beneath, with square paneled walls pierced by rectangular

windows, crowned by a plain entablature, and bearing an octagonal dome. Small scroll buttresses, set against the diagonal faces, fill the angles of the square below at the junction. They are not of beautiful outline, but make the difficult transition from the octagon to the square with unusual elegance. The curves of the dome are circular, making its section a pointed arch and so considerably higher than a hemisphere.



X. Peruzzi's Tower, Sienna.

THE COLOR QUESTION SETTLED.

That is what the Ricketson Mineral Paint Works, Milwaukee, Wis., say in their new and latest leaflet. It's quality that they wish to call your attention to, and it's quality that counts. No getting around that. One cannot afford to slight or to be stingy with a little color in making their goods.

The Reds, Browns, Buffs, Purple and Black never fade and are used for cement building blocks, clay or cement, cement and sand line brick. Write direct to them if you are interested.

Four hundred employes of the brick works at Mechanicsville, N. Y., are on a strike, asking for 25 cents per day more pay.

REFRACTORY MATERIALS AND THEIR APPLICATION.*

By A. J. AUBREY, St. Louis.

While metallurgy has made rapid strides forward in the advancement of science, the study of refractory materials has lagged behind like the proverbial race horse that "also ran," and the writer ventures the assertion that there is less available knowledge at hand concerning this one subject than of any other factor of so vital an importance to the practice of metallurgy and to other manufacturing interests. There is a dearth of scientific data on this subject and while the physical constants of even some of our rarest metals have been determined, practically nothing along similar lines can be found in our various reference books concerning refractory materials.

The writer has attempted to prepare a paper outlining the scope and possibilities of proper study and research in the field of refractory material, offering a few personal observations, with a view not of illuminating this convention, but rather of presenting to you a few facts with which some of you are undoubtedly familiar.

Refractory is the term generally applied to materials that are fusible, only at or above 3000° F., approximately Seger Cone 27. Broadly speaking, refractory materials are materials infusible at the temperatures at which they are used.

Classifying and arranging the list of refractory materials, we have them as follows:

First. Carbon and Carborundum: Withstanding the highest temperatures—4000 F., to 7000 F. and above.

Second. Magnesite, Bauxite, Lime, Dolomite and Chromite: Withstanding medium high temperature—3400 F., to 4000 F.

Third. Silica, Flint Fire Clay Kaolins and Plastic Fire Clay: Withstanding low temperatures—2800 F., to 3400 F.

Briefly describing their uses and characteristics we have first:

Carbon: This is a material that one seldom stops to consider as a refractory on account of its combustibility, but which is nevertheless that most highly infusible of all refractory materials known. At the highest temperature attainable it volatilizes, and at all temperatures above 100° C., it combines readily with oxygen, for which it has great affinity. It can only be used as a refractory material, therefore, in cases where it is not exposed to the atmosphere, for example: in air tight chamber such as the inside of an electric resistance furnace.

A recent patent, by F. Bolling, covers the production of carbon blocks covered with carborundum. The carbon block of desired form is embedded in a mass of finely powdered silicon, or boron carbide, and by means of a "special firing process" the surfaces of these blocks are transformed into carborundum by "absorption." Beyond its use for lining electric furnaces carbon finds little use as a refractory material, but inasmuch as the electric furnace is on the increase, it bids fair to be used more extensively in the future.

Carborundum and the Silico-Carbides: Carborundum is composed of seventy parts silica, and thirty parts carbon, and is manufactured from coke and sand in the electric furnace at Niagara Falls.

Silico-Carbides: The silico-carbides, or siloxicon are compounds of oxygen, silica and carbon in varying proportions, formed at temperatures below the formation of carborundum and are therefore less refractory. Carborundum is infusible at 7000 F. and is unaffected by gases such as oxygen, ozone, chlorine or bromine at 3000 F. At temperatures ranging considerably above 3000° F. it is attacked by

chlorine and oxygen, the latter forming a coating of silica over the grains at these temperatures. It is decomposed by fused alkalis and is decidedly acted upon by basic slags at high temperatures, but at temperatures around 3000° F. is not affected.

For making carborundum blocks tar and glue are used as binders, after which the blocks are subjected to a firing process at high temperatures consisting of a period of long continued oxydation which forms a coating of silica over the grains and binds them firmly together. Fire clay and sodium silicate are also used as bonds; for ordinary temperatures; that is, below electric furnace temperatures. A lining bonded with sodium silicate softens at high heat. Fire clay serves better for this reason. Brick coated with carborundum have a hard surface that cannot be scratched with the hardest tool steel. By means of carborundum you can create a dense, hard impenetrable surface on a porous flint-clay brick.

Mr. E. Kilburn Scott in a paper heard before the Faraday Society on "Refractory Materials," cites several instances of the recent uses of carborundum as a wash over fire brick, showing that it gave decided improvement and that it was not necessary to have a homogeneous body of carborundum in order to take advantage of its properties.

He cites an instance of a welding furnace, in which the lining was coated with carborundum, that showed no serious effects after six months service. He also mentions its use for repairing cracked gas retorts, pointing the joints of brickwork in by-product coke ovens in order to make them gas tight, protecting iron pipes that are subjected to high heat in blast furnaces, etc. In the latter case the life of the iron pipes was increased from two and one-half to nine months. When used as a covering for iron or metals, the metal must be kept heated as the coating of carborundum falls off when cool.

Oxide of aluminum, or alumina, occurs naturally as corundum (Al_2O_3) the anhydrous oxide which is found only in small quantities, also as diaspor, gibbsite and bauxite, the hydrous oxides, of which bauxite is the only one found in commercial quantities. Pure alumina is also made as a by-product in the Goldstein Thermit process and has the trade name "Corubin."

"Corubin," is free from water, has a low coefficient of expansion and does not lose this latter characteristic when bonded with fire clay, according to Dr. Buchner of Mannheim. A vessel made of pure corubin can be heated to a red heat and cooled suddenly with water without cracking. It also has a high refractory value for coating brick and tubes exposed to high temperatures.

Bauxite, which is a hydrated oxide of aluminum, corresponding to the formula ($\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$) is found in Georgia and Alabama, in New Mexico, and in Arkansas, the latter State furnishing the greater part of the bauxite used at the present time in this country. It is highly refractory, fusing at electric furnace temperatures depending upon the purity of the variety used, as it contains silica, oxides of iron and titanium, in varying quantities.

It is basic and is unaffected by oxygen at all temperatures; is specially resistant to basic slags and oxides of the metals in fusion. It is now used for lining the hot zones of rotary portland cement kilns and the walls of lead refining furnaces, and has been tested and shown up very favorably in connection with basic open-hearth furnaces.

Sir Wm. Siemens found it a superior lining for iron and steel furnaces, lasting six times as long as the "Stourbridge first brick." Its application is in the experimental stage, and undoubtedly it will assume a place among the refractory materials used at the present time.

Magnesia or Oxide of Magnesium, familiarly called

* Read at the 1906 meeting of the National Brick Manufacturers' Association held at Philadelphia in February.

Magnesite, is obtained by calcining the mineral magnesite or magnesium carbonate which occurs in Austria, Greece, Norway, So. India, and in our own country in California. It is highly refractory when pure, but generally carries silica and iron as impurities. It fuses at electric furnace temperatures, depending on its purity.

In chemical activity it is basic and resists the action of basic corrosive slags, such as are encountered in the basic open hearth steel furnaces. For this reason, it is widely employed in furnaces of the above type. It also finds some use in rotary portland cement kilns. E. Kilburn Scott claims that "electrically shrunk crystallized magnesite" is "highly refractory" and can be used as a wash over fire brick to great advantage.

Pure magnesia tubes and crucibles are now manufactured by the Royal Porcelain Factory of Berlin. They are not only refractory, but can be heated suddenly in an air blast without danger of cracking and show no electrolysis when heated up to 1750 C. in an electric furnace, which is quite important.

Chronite or Chrome Ore is an oxide of Chromium (Cr_2O_3) and is very infusible, but is not extensively used. In chemical activity it is neutral and is used for separating basic and acid brick where they come together as in the walls of a basic-open hearth furnace; for example, the hearth is lined with magnesite which is basic, and the crown and walls with silica brick, which are acid. Usually a course of chrome brick is layed between the two to avoid chemical action at high temperatures. The brick are bonded with fire clay and molded and burnt similar to fire brick.

Dolomite, which is a mixed carbonate of lime and magnesia ($\text{MgCO}_3\text{CaCO}_3$) is calcined and separated from its carbonic acid gas. It is manufactured into brick and in England is used quite extensively in the basic open hearth furnaces as its chemical action is basic, but it is not entirely satisfactory and is being replaced by magnesite.

Lime is very infusible, but is little used as a refractory on account of its difficult application. It can be applied as the byrate, afterwards heating it to drive off the water, but it must be kept constantly heated above 100 C. to keep it from hydrating again. It is quite soft and a poor abrasive although it is practically as good a heat insulator as fire brick. It is highly basic and is attacked by acid gases such as carbon dioxide (CO_2), sulphur dioxide (SO_2), chlorine, etc. So far its use has been very limited.

Silica is one of the commonest of the earth's minerals occurring in various forms, and still it is one of our best low grade refractories, fusing at about 3220° F. At high temperature it becomes an active acid and has great affinity for basic substances, attacking them readily. It is manufactured into brick from crushed gannister of quartz rock, as sand is not suitable, is then bonded with about 2% hydrated lime and moulded into brick and burnt in kilns like fire brick. When made, the brick analyze about 95 per cent. to 96 per cent. silica. They are used extensively in the crowns and walls of open hearth steel furnaces, in glass pot furnaces, copper furnaces and elsewhere.

Articles are now being produced from fused quartz which are highly refractory and are unattacked by acids. On account of their low coefficient of expansion these articles can readily be plunged into cold water while white hot without serious effects.

Fire Clay: The refractory clays comprise the plastic and flint fire clays, the kaolins and ball clays. The plastic and flint fire clays are very generally used, but the kaolins and ball clays are seldom employed as refractory materials principally because they are more valuable for other purposes.

The plastic and flint clays are used in combination and separately. Brick are made entirely from flint fire clays

as well as with varying proportions of both flint and plastic clays. Occasionally plastic clays are mixed with coarse particles of quartz though this practice is generally declining.

The refractoriness of a fire clay depends on its silica-alumina ratio, on the nature and content of its fluxes, and on its fineness of grain. Of these the most important is undoubtedly the silica-alumina ratio; the lower the silica content and higher the alumina the more refractory will be the clay. With some few exceptions, it has been generally observed that brick that run over 65 per cent. silica are not refractory. (See paper on "Refractoriness of Some American Fire-brick," by R. F. Weber in Trans-American Institute of Mining Engineers.) The average range of the silica in refractory bricks is between 55 per cent. and 65 per cent. It has generally been observed that in refractory brick where the total content of fluxes is high the silica-alumina ratio is generally low, and that where the silica-alumina ratio is low the total content of fluxes may be high without seriously injuring its refractory qualities. However, the silica content of a brick, in which coarse quartz particles are added for a non-plastic, cannot be compared with the silica content of a fire clay brick where the only free silica there is, is what occurs naturally in the clay. In this case a rational analysis and an analysis of the clay forming the matrix of the brick is required to admit of any comparison. Indeed a great deal of the confusion that exists in comparisons of chemical analysis is due to the fact that no distinction is made between brickcarrying quartz particles as an addition and those containing free silica naturally. A highly aluminous matrix is an important feature as the matrix generally fuses first on account of its fineness. It is possible to produce a refractory brick using quartz as non-plastic provided a highly aluminous clay is used for the matrix and the quartz particles are sufficiently coarse.

The fusibility of fire clays varies widely. The most refractory clays fuse between Seger Cones 33 and 36, approximately 3254° to 3362° F. Others fuse anywhere between 3000° and 3250° F., while some of the low grade clays which, however, are not generally classed as fire clays, fuse between 2800° and 3000° F.

At the present time there are many different kinds of fire brick put upon the market. They vary greatly in quality, in physical and chemical compositions. The mechanical treatment the clay receives in manufacture tends to give it certain characteristics. For instance, grinding, mixing, aging, weathering, washing, semi-drying and repressing, hand-making and machine-making, burning, etc., all have their different effects on the product.

To intelligently produce a brick of certain qualities, we must find out what qualities are required in a brick for a certain purpose, and to do this we must turn our attention to the smelters and furnaces where they are to be used. In general we must familiarize ourselves with the chemical and physical conditions in these furnaces, such as the temperatures attained, the slags or fluxes, if any, that are to be encountered, the mechanical action such as abrasion, the action of gases oxidizing or reducing, the nature of the fuel, oil, gas, coke or coal, and the manner in which it is used, the position and construction of the material in the furnace, whether it is required to stand compression, tensile or bending strains, etc.

Having a working knowledge of our furnaces, we now turn our attention to our materials and study the following points in connection with them.

1. Fusibility.
2. Chemical activity of the material at high temperatures, acid, basic or neutral. How acted upon by gases, slags, etc.

3. Thermal conductivity of the material at high temperatures.
4. Hardness, toughness and abrasive qualities.
5. Density and porosity.
6. Specific heat.
7. Coefficient of expansion—ability to withstand changes of temperatures.
8. Strength of material at high temperatures.

Upon our knowledge of the above points depends our ability to prescribe suitable material for furnace operations.

Considering the above points in regard to their value in the application of the material, we have first.

Fusibility: There is perhaps more information on this point than on any of the others, nevertheless there is not an accurate, complete list of the fusing points of the various refractory materials, and especially are some of the higher grades neglected on this point. Fire brick are generally known approximately, but accurate melting points are rare.

The reason for this is because a satisfactory high temperature furnace for testing fusing points of refractory materials is hard to obtain. The Devile furnace is practicable for fusing fire clays, but hopes are generally centered in the electric furnace for high temperature work. So far nothing very practical has appeared on the market. The Heraeus platinum and iridium electric resistance furnaces are very practical up to the points somewhat below the melting points of their respective metals, but for long and continuous heats the platinum wound furnace cannot be used above 1400°C ., or some 380°C . below the melting point of platinum according to the Bureau of Standards at Washington. The Kryptol electric furnace has not come up to expectations in so far as the writer has been able to learn. For the measurements of temperature up to 1600°C ., the thermo couple is the most practical, while for measurements of high temperatures the Wanner optical pyrometer gives satisfactory results.

When brick are set in the walls and are only exposed on one surface, the temperature of the furnace may be kept close to or even at times go beyond the fusing point of the brick without serious damage to the lining. On the other hand, if brick are constantly surrounded with heat as are the settings of gas benches, checker-work brick, etc., the extremes of temperature are more dangerous and the temperature must be better controlled and kept at a safe distance below the fusing point or serious results will ensue.

Chemical Activity: It is important to know the chemical activity of the brick, and this is known in a general way of most of the refractory materials. For instance, it is generally accepted that magnesite, bauxite, lime and dolomite are basic, silica brick, acid, and chrome and fire brick neutral, although fire brick may at times contain free silica and act as an acid and again may be practically free from it and approach pure silicate of alumina which is a basic silicate.

It does not necessarily follow that because an acid fails a basic one is needed. The writer knows of a case where bath a silica and magnesite brick lasted one day while a fire brick lasted two weeks.

Thermal Conductivity: The importance of this constant of refractory material has generally been lost sight of, and it is only recently that any efforts have been directed toward an understanding of the heat conductivity of refractory products.

Roughly, we can classify refractories under two main divisions. First, material for conducting heat; second, material for insulating heat. Under the first head we have, for example, crucible melting, muffles, gas retorts, by-product coke ovens, etc. Here it is quite apparent that the better the heat conductivity of the material, the greater will

be the economy of the operation. Under the second head, we have the linings for blast furnaces, smelters, lime kilns, rotary portland cement kilns, brick kilns, boilers, etc.; in general linings for protecting the metals used in the construction of the furnace. Here it is apparent that the better heat insulating qualities the brick possess the less the danger to the metal parts of the furnace, the less heat lost by conduction and radiation and the greater the economy of the operation. (For an abstract of above paper see paper on "Materials used in furnace construction," "Iron and Coal Trades Review" for July 21, 1905.) The results of some very interesting experiments on the determination of heat conductivities of many of our refractory materials carried on by Messrs. R. S. Hutton and J. R. Beard in the Physical Laboratories of the Manchester University were presented recently before the Faraday Society.

They also made tests of the relative value of different heat insulating materials at comparatively high temperatures, and these demonstrated that at high temperatures fire brick is the best heat insulator; that is, it has the lowest heat conductivity of any of our refractory materials. Infusorial earth and light calcined magnesia were still better non-conductors of heat than fire brick, but they cannot be used at high temperatures on account of their excessive shrinkage. It was suggested that they be used for jacketing materials on the outside of the furnace between the brick and the shell, and it seems reasonable to use them in this manner.

At 100°C ., at which temperature the thermal conductivities were determined, white Calais sand showed the highest heat conductivity, followed by carborundum, calcined and fused magnesia, retort graphite and fused quartz, down to lime and lastly fire brick, which showed the lowest heat conductivity of the refractory materials.

There still remains large room for study and investigation along this line; namely, to determine the difference in thermal conductivities for different kinds of fire brick and fire clay material, also to find out the conductivity at high temperatures under long and continuous heats comparable with gas bench and retort operations.

Although it is apparently absurd to use the same material for insulating and conducting heat as in the case of fire clay retorts, as long as fire clay is inexpensive and has plasticity and tensile strength in its favor, it is likely to be used for such purposes where other physical requirements are of still more importance than the thermal conductivity. On the other hand, in muffles built of brick and other cases where the construction is possible there is no reason why advantage should not be taken of our present knowledge of thermal conductivity and silica or magnesite brick be substituted for fire brick. The saving in fuel possibly would justify the increased expenditure for materials, and certainly tests could be made along this line to establish whether they would or not.

Hardness: The hardness and toughness of refractory materials is important because it is closely allied with the abrasive qualities and in many cases fire brick must stand abrasion at high temperatures as in cupolas and blast furnaces. There are also places where heavy bars are used in clinkering, and if brick are too soft in such places portions chip off and are lost. Then again certain brick are used in operations where the degree of hardness is important, as in the hot zone of rotary portland cement kilns, if a brick is too hard it will not allow the cement coating to stick, and the covering of the brick with this coating insures a much longer service. Again if the brick are too soft, although the coating will stick it occasionally pulls off bringing portions of the brick with it.

Density and Porosity: These are inverse qualities, the greater the density the less the porosity, and vice versa. One operation demands a dense product while another operation demands a porous one. When slags and fluxes are to be encountered a dense brick will outlast a porous one of the same quality and very often of a superior quality. Glass pot clay must burn dense at comparatively low temperature and nothing works better than the fine grained washed clay or natural fine grained pot clay. Of course the density of the material depends upon the fluidity of the flux to be encountered. Some are viscous like blast furnaces and cupola iron slags. Others are liquid, watery slags like lead slags. If brick are too porous even molten metals like lead will not only be absorbed, but will find their way through the brick, pass down between the shell and the lining and coming up under the brick hearth underneath force it up and distort it as the writer can testify. Crucibles for assay work should be very dense, as the reliability of the assay depends on the lack of absorption of the metals.

In certain oil burning furnaces the oil is sprayed directly against the hot brick and an intense local heat arises from the combustion which takes place on the surface of the material. The result is that the brick are cut out like a "honey comb." A porous brick here will not answer as well as a dense brick because the oil penetrates it too readily. On the other hand a dense mud brick spawls off while a dry press brick seems to give the best satisfaction; in this case the writer believes a coating of carborundum over the surface of the fire clay material subjected to the spray of oil will greatly increase its durability.

For bung brick and brick at the ports of furnaces where pre-heated air and gas unite in combination, a porous coarse brick full of highly refractory grog stands the cutting action of the flames much better than a dense brick.

Specific Heat: A knowledge of the specific heats of our various refractory materials is valuable because of its importance in operations involving the absorption of heat by refractories, such as the brick work in blast furnace stoves, checker-work in regenerative flues, etc. In all examples such as the above the brick are used to absorb and collect heat from waste gases and deliver it in turn to the air passing over them. The specific heat of a substance is the exponent of its heat absorbing qualities.

We learn in physics, that the denser the body the lower the specific heat and the more porous the body the higher the specific heat; also that the specific heat is greater at high temperatures. Accordingly a porous brick would be more suitable for checker-work generally speaking. However, little investigation has been made along this line and we know comparatively nothing about the value of different materials for uses where heat absorption is an important factor.

Definite data concerning the coefficients of expansion of our refractory bodies would be very helpful to designers of furnaces as well as to metallurgists. At present our knowledge is limited to a few generally accepted facts. We know that as a rule dense bodies crack more easily than coarse, porous bodies under unequal applications of heat, and for this reason coarse bodies are generally used to withstand sudden expansion and contraction. We have also learned that dry press brick do not spawl off like mud brick, but beyond a few facts similar to the above our information is scarce.

Opposed to the statement that dense bodies crack more easily than coarse ones, we have the fused refractories, quartz, alumina and magnesia, which are dense but have low coefficients of expansion and can withstand sudden changes of temperature without cracking. It would seem then that certain refractory oxides of the metals when pure

and fused have low coefficients of expansion, and it is possible that the rule will apply to other refractory oxides.

The structural strength of the material at high temperatures is an important phase of the problem of application. Wherever possible the construction of the furnace is so designed that the refractory body is exempt from strains and undue weight, but in certain operations, for example, in gas benches, the settings are required to bear certain loads and must have sufficient strength at the temperatures of the operation to bear up the superstructure.

Some valuable work has been done along these lines by Mr. Lemon Parker of St. Louis and his method and results are available in Vol. VII of the transactions of the American Ceramic Society. It does not seem unreasonable to demand of the manufacturers of refractory materials that they guarantee the ability of their material to withstand certain loads at certain temperatures.

With a knowledge of the various qualities of our refractory materials as outlined above and a sufficient understanding of the requirements of the furnaces the correct application becomes a simple matter.

After everything has been done to secure proper material there still remains an important means of preserving it in certain types of furnaces. This is accomplished by cooling the metal plates on the outside of the furnaces with water. The loss of heat in this manner, which has been proved to be only some 5 per cent. of the total, is made up by the increased length of campaign of the furnace.

The old method of applying water for cooling was accomplished by means of water jackets and bosh plates, but the more recent procedure is to cool the steel or cast iron plates on the exterior of the furnaces with a spray of water, and this is not only equally as efficient but is cheaper and works better mechanically. As long as the film of water is kept on the surface of the metal the temperature cannot exceed 100° C., and accordingly it has the same effect as a large stream of water would have.

A recent application of this principle has been made at Geismar, in Germany, where there is a blast furnace cooled by a spray of water from top to bottom. It is lined with three inches of fire brick and has already endured a strenuous campaign of four years, and there is no reason apparently why it should not last for a much longer time.

In conclusion the writer wishes to say in defense of the manufacturers of fire brick and other refractory material, that many of the difficulties and troubles that arise from time to time are not due to faulty materials, as very often defects in design and poor construction combined with an attempt to use inferior materials because of their lower cost are the causes of disaster.

Such things as turning arches out of square brick, using soft brick in flat arches, submitting tile to bending strains, etc., are responsible for many failures laid at the door of the manufacturers. Continuity of operation is the key to economy in most metallurgical processes, and only serviceable materials will fill the bill. The cost of repairs including loss of output often exceeds the cost of materials, so that it is only the best which are the cheapest in the long run.

When the consumers of refractory materials are educated up to the point where they will be willing to pay better prices for special materials adapted to their uses, then the manufacturers will gladly meet their demands.

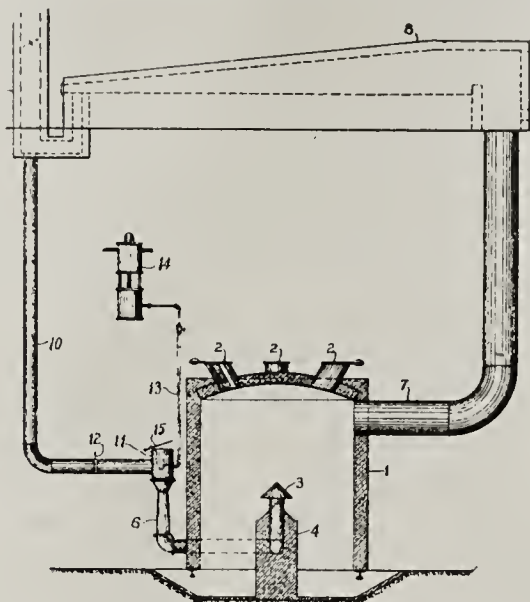
FORTY-FIVE YEARS A BRICKMAKER.

John Tyler Washburn of Saugerties, N. Y., on Tuesday, the 1st of May, completed his forty-fifth year as a brick manufacturer. He commenced making brick at Haverstraw at the age of 19 years, and has since followed the same business.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

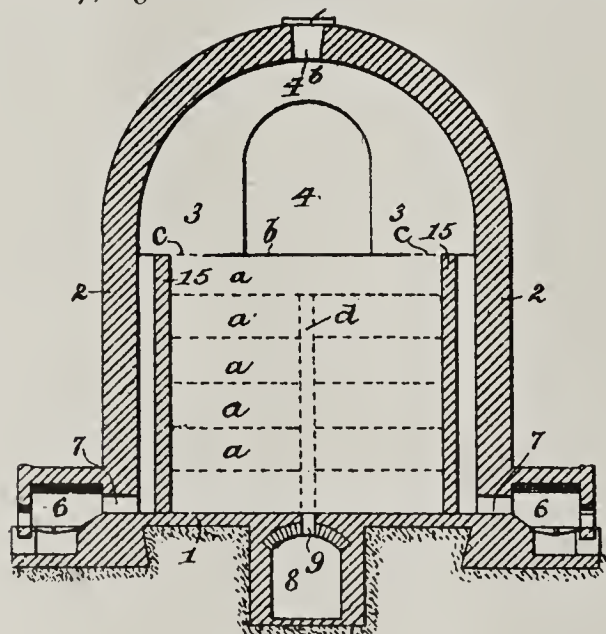
These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

815,913. Gas-Producer. Carleton Ellis, New York, N. Y., assignor to Combustion Utilities Company, New York, N. Y., a Corporation of New York. Original application filed May 11, 1905. Serial No. 259,925. Divided and this application filed July 1, 1905. Serial No. 267,920.



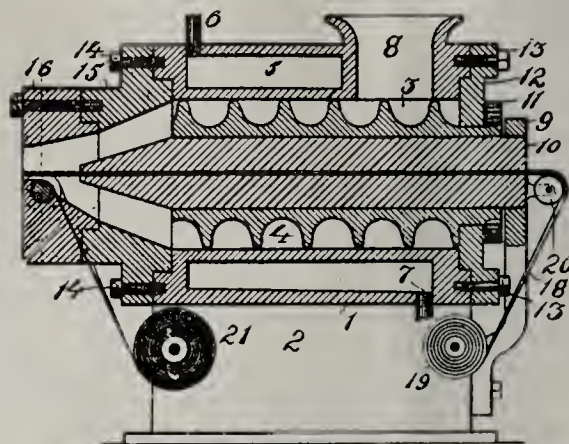
Claim.—In a gas-producing plant, the combination of a gas-producer, a source of products of combustion, a pipe connection from the source to the producer and an interposed collar in said pipe connection carrying an air-jet nozzle and having valve-controlled communication with the atmosphere.

816,387. Method of Treating Plastic Material. Alexander A. Scott, Knoxville, Tenn. Filed Nov. 16, 1905. Serial No. 287,623.



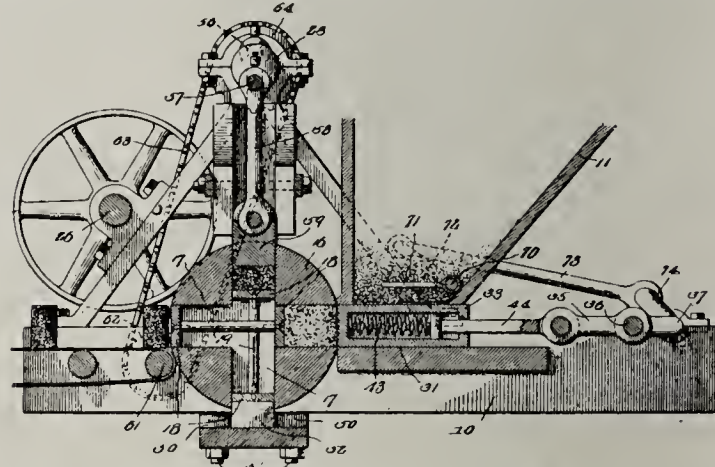
Claim.—The herein-described method of treating plastic material, which method consists in forming said material, in the green state, into blocks; then setting said blocks in a plurality of superposed groups; and, after the setting of each group, driving a drying agent into the base of said mass of blocks between the upright sides of said mass and thence through said mass; then subjecting the entire mass of said blocks to a highly-heated gaseous medium; and passing said gaseous medium thence to and through another group of green blocks, substantially as described.

815,571. Machine for Making Continuously Formed Articles from Plastic Material. John K. Williams, Akron, O. Filed Aug. 31, 1905. Serial No. 276,541.



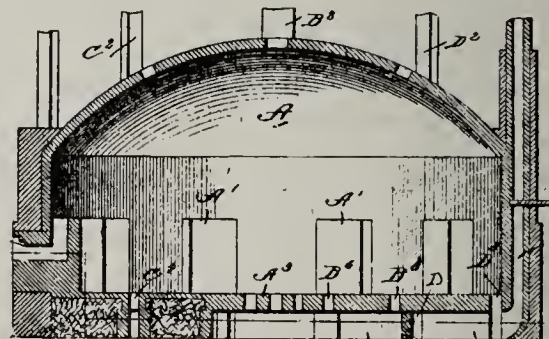
Claim.—A machine of the class described comprising an inclosing casing provided with an opening therein, a revoluble feeding-screw in said opening, a perforated mandrel arranged to pass through said opening in said screw, means whereby plastic material may be fed to said screw, a die suitably sustained in position with respect to said screw and mandrel, means to conduct a stiffening device or its equivalent through said mandrel whereby it will be incorporated in the material issuing from said die, and means to cover a portion of the material issuing from said die with fabric or its equivalent.

816,374. Brick-Making Machine. Charles W. Pratt, Martin, Tenn., assignor of one-half to Thomas J. Taylor, Martin, Tenn. Filed Dec. 13, 1904. Serial No. 236,704.



Claim.—The combination with a revoluble cylinder having diametrically-opposed molds, of bottom plates arranged in said molds, a ratchet, connecting means between the bottom plates, a re-pressing die for engaging the material in one mold and forcing the same against the bottom plate, and a presser-block engaging the opposite bottom plate and tending to resist said movement.

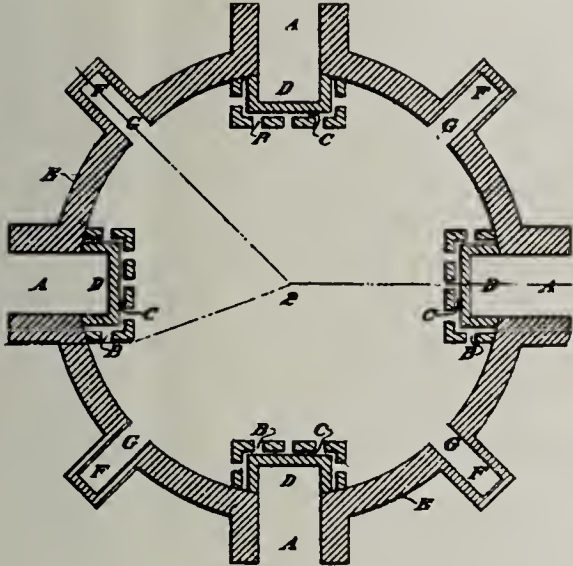
816,752. Downdraft-Kiln. George E. Snowden. New Cumberland, W. Va. Filed July 24, 1905. Serial No. 271,080.



Claim.—A downdraft-kiln provided with chimneys disposed at the outer kiln-wall, a central draft-flue beneath

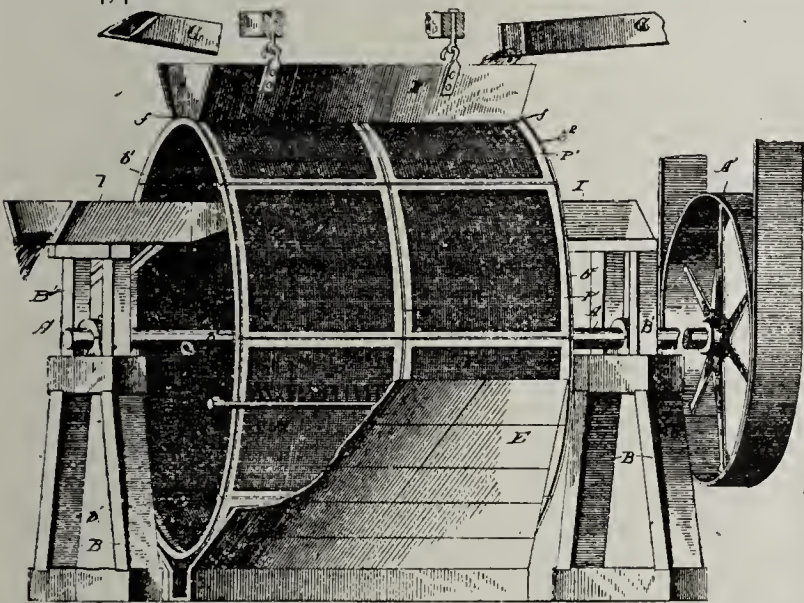
the kiln-floor provided with radially-extending flues each communicating with a chimney at its outer end, independent segmental flue systems at each side of the central flue and provided with a plurality of radial flues each communicating with an independent chimney, and a floor structure provided with elongated draft-ports adjacent to each of the chimneys controlling the segmental flues.

815,388. Kiln. Robert W. Stewart, Findlay, Ohio. Filed Dec. 4, 1905. Serial No. 290,148.



Claim.—In a kiln, a chimney having a main or fire flue that takes air from the exterior of the kiln, and a supplemental flue adjacent to and surrounding three sides of the main flue the air therein being heated by the wall of the main flue, said supplemental flue communicating at its upper and lower ends with the interior of the kiln.

816,426. Revolving Drum-Screen. John P. Brew and Edwin P. Suiter, Basin, Mont. Filed June 9, 1905. Serial No. 264,421.



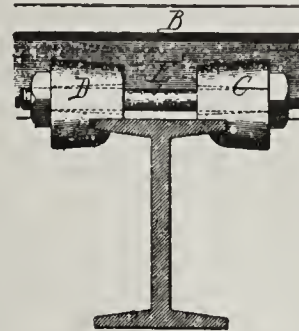
Claim.—A revolving screen comprising a central shaft, a drum having a peripheral covering of screen material and open ends, a central supporting-frame connecting the shaft to the drum and consisting of a central spider with radial arms rigidly attached to the shaft and having adjustable spoke ends, an external hopper placed above the drum for feeding the material on the outer surface of the same and two reversely-inclined discharge-troughs, arranged in the drum and extending from the center outwardly and downwardly through the open ends of the same and external supports for these discharge-troughs.

813,738. Rail-Clip. Louis E. Rodgers, Chicago, Ill. Filed Nov. 17, 1905. Serial No. 287,815.

Claim. In a rail-clip, the combination of two separate

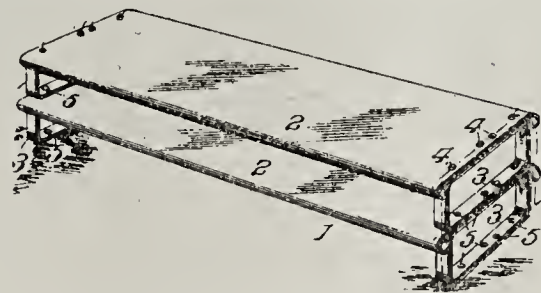
metal parts provided with coincident bolt-openings and each having recesses for engaging flanges of both the rail and tie, and a bolt passing through said openings with means thereon for tightening the parts in clamping engagement with the rail and tie.

In a rail-clip, the combination of a metal part comprising a bar having an upper surface to bear against the under surface of the rail, a longitudinally-extending recess in one side to engage a flange of the tie, a boss having a recess to



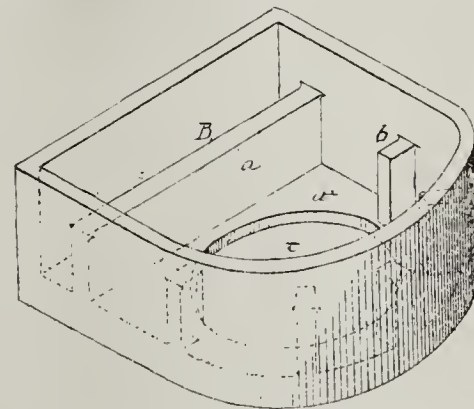
engage a flange of the rail and a boss provided with a bolt-opening, a separate metal part having a bolt-opening and recesses, one of which engages a flange of the tie and the other a flange of the rail, and a bolt passing through said openings with means thereon for tightening the parts in clamping engagement with the rail and tie.

817,689. Brick-Pallet. Frank Bentley, Niles, Ohio. Filed Oct. 18, 1905. Serial No. 283,305.



Claim. A brick-pallet comprising a flat body portion, legs depending therefrom at each end, and means for securing such legs to the body portion, such means forming projections above the upper surface of such body portion, the legs being so constructed in their lower portions as to engage with the projecting portions of a pallet upon which it may be superposed so as to thereby prevent the pallets from slipping either laterally or longitudinally.

817,722. Sagger for Baking Pottery. John W. Lyons, Philadelphia, Pa. Filed Dec. 29, 1905. Serial No. 293,840.



Claim. In a sagger, the combination of a body portion, a bottom having an opening therein, a partition at one side of the opening forming a pocket, a series of projections, with a slab mounted on the partitions and projections and less in width than the body portion so that the back of a washstand-form resting on the slab can project into the pocket.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico
and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the sub-
scribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII.

MAY 15, 1906.

No. 9

"I like to read American advertisements. They are in
themselves literature, and I can gauge the prosperity of the
country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the
very time that advertising should be the heaviest. Ninety-nine
out of every hundred merchants advertise most when there is
least need of it, instead of looking upon advertising as the pan-
acea for their business ills.—John Wanamaker.

A self-conceited man revolves around himself.

The important part of every man's business is to know
what to do next.

Somebody reaps the benefit of every advertisement. If
it is not the man who pays for the space it is his own fault.

Beware of the man who boasts of his good deeds; he
probably only awaits a favorable opportunity to do a mean
one.

In its way the gold cure may be all right, but a man
seldom feels the need of the cure until his gold is all
gone.

It doesn't pay to argue. Congratulate yourself on being
so much more sensible than the other fellow and let it go at
that.

Subscribe for THE CLAY RECORD, the only Clay Journal
in America that is printed twice per month. Only one dollar
for a whole year, and you get the news before it becomes
stale, at least the chances are that you will. Do it now.

Now is the time to plant your advertisement if you want
to reap a harvest. Don't wait until the buying has all
been done. If you have the goods and want to sell them, tell
the people so, and the best medium in which to make your
statement to the buyers of clay working machinery is the
semi-monthly CLAY RECORD.

So long as the American people are given to waking up
from time to time, and asserting themselves, the country is
safe.

The fraud and double-dealing with which the school boy
now is acquainted were known to students of affairs sev-
eral years ago and at intervals articles bearing on the sub-
ject appeared, yet were ridiculed and the writers dubbed
cranks. It was pointed out in these columns that the
manipulation by the few in favor of the elect few of the
enormous surpluses in insurance, trust and banking com-
panies accounted for the enormous expansion over night
of individual fortunes, and every contention has been more
than confirmed in the developments of recent investiga-
tions. The people have awakened not a moment too soon,
rather it had been well if the awakening had come earlier,
however, one thing is sure, the energy being displayed by
courts and legislatures along lines antagonistic to the prac-
tices of recent years, if results follow as demanded, then a
revolution in this country at this time is averted, other-
wise we shall experience an upheaval the like of which has
never been experienced in this world so far as its history
maketh known. Money is the god worshiped. The man
possessing it in abundance is a law unto himself, at least
he thinks so and justifies himself on the ground that his
lawyer takes care of his legal rights, and the latter for a fat
fee will lie and steal, encourage contempt for law which
he took oath to maintain and strengthen when admitted to
the bar. All this has resulted in it being found possible to
have anything done, or evaded or blocked, provided you
have the dollars to advance to the scoundrels who are ready
to do this work under the direction of "leading lawyers,"
so-called.

How much longer will the rank and file of the American
people put up with the prevailing practice of men who
simply have money and with the advice of counsel lying
away in the night season to a state where the summons of
a court of a sister state cannot be served on them? Be-
cause a man has a few dollars is he superior to his fellows,
above law; is he a law unto himself? The people have
already answered these, and similar questions, in an un-
mistakable and emphatic negative, and if the so-called
financial interests of America be wise they will change their
present tactics, and that quickly, letting the world see the
sure evidence of it; otherwise, within the next two years
it will be found too late and the uprising of the American
people meanwhile unmistakably and desperately against
them.

HEALTH CONDITIONS OF POTTERY INDUSTRY.

An interesting and instructive article on "The Health Con-
ditions of the Pottery Industry" forms a part of the annual
report, just issued by Winton C. Garrison, chief of the New
Jersey state bureau of statistics. The bureau maintains a
general oversight of all the New Jersey industries.

The pottery report referred to is based on an investigation
made in 33 potteries at Trenton, the eastern pottery center.
The inquiry was directed toward ascertaining the date of

the establishment of each pottery, the number of workmen employed and the number of deaths among employes during the year, the number of fatal accidents, the diseases peculiar to the industry, the branches of the trade that are considered unhealthy, the principal ill-health producing factors, the branches of the industry that offer the greatest liability to accident and also the principal accident producing features.

The whole report, compared with the investigation along the same lines in previous years, tends to show that the hygienic conditions of the industry are much better today than they were three, five or ten years ago. Diseases that were once very prevalent are now almost unknown.

Garrison calls special attention to the fact that the intemperate use of liquor, which was notably prevalent during the early years of pottery manufacture in Trenton, has almost entirely disappeared.

ACCIDENTS, DAMAGES AND LOSSES.

Walter Ramsey lost a leg by being caught in the machinery at a brick yard at New Castle, Pa.

Andrew Schick has been appointed receiver for the Marion (Ind.) Clay Pot Co. at the request of Uriah S. Shelly.

Elmer S. Ranberg, an employe of the Coffeyville Vitrified Brick Co. at Chanute, Kansas, was killed by falling into the dry pan.

A boiler at Brown Brothers' tile factory, Crawfordsville, Iowa, exploded, two workmen were killed and the plant was wrecked.

D. L. Conklin, brick manufacturer at Hamilton, Ont., has made an assignment to the state bank of Hamilton. His liabilities are \$6,000.

The courts gave damages to the amount of \$3,808 to John Bentley for the injuries he received at the plant of the Altoona (Kansas) Brick Co.

Robert M. Wilson has started suit against the Fredericksburg (O.) Coal and Brick Co., claiming that the company owes him \$2,000 for services as superintendent.

Mrs. H. T. Urquhart has bought in on a mortgage the plant of the Granite Brick Co., at Little Rock, Ark., for \$13,608. It is understood that she will operate same.

Peter A. Mattson filed suit against Calvin & Leek, brick makers, Ogden, Utah, for having made holes in his property for the purpose of securing brick clay, and prays for \$2,000 damages.

C. A. Everhart, a visitor at the Salina (Kansas) Brick Works was caught in the machinery and had his arm twisted off. He visited the plant with several friends to see the new machinery operate.

On a petition of Peter Burns, the Burns & Shea Brick Co., Springwells, Detroit, Mich., has been restrained from manufacturing brick or taking clay from the property they have been working, which belongs to the Burns' heirs, unless the taxes of the past two years have been paid.

OBITUARY.

T. J. Frazier, president of the Carthage (Texas) Brick Company is dead as a result from an accident. He was hauling a new brick machine to the works and was thrown from the wagon and the machine fell on him, injuring him so as to cause death after several days.

William Cartwright, one of the oldest manufacturing potters, died at Wellsville, Ohio. He was born in England and was associated in the pottery business with his sons.

William Taylor, who formerly lived at St. Peter and Ottawa, Minn., died at his home in Brooklyn, N. Y., He was 62 years old and born in England.

FIRE! FIRE!! FIRE!!!

Fire caused a loss to the extent of several hundred dollars to the plant of the Guyan Valley Brick Co.'s plant at Barboursville, W. Va.

The plant of the Fultonham Brick Company at Fultonham, Ohio, was totally destroyed by fire of unknown origin. The loss is \$15,000, with no insurance.

The fire brick and retort works of the late James Gardner Jr. & Co., of Lockport Station, Pa., was very badly damaged by fire, causing a loss of several thousand dollars and throwing thirty men out of employment. The office of the company is at Pittsburg.

The plant of the Hamilton & Toronto Sewer Pipe Co., at Hamilton, Ontario, was destroyed by fire, causing a loss of \$50,000, fully covered by insurance.

The plant of the Standard Porcelain Works at New Cumberland, W. Va., was badly damaged by fire. The loss will amount to \$10,000. Captain John W. Porter is superintendent of the plant.

Fire broke out in the factory settlement of the H. Stevens & Son Clay works at Macon, Ga., and destroyed eight of the tenement buildings, valued at \$500 each. An explosion of a kerosene lamp caused the fire.

CUBAN CLAY PROMISES TO OPEN NEW INDUSTRY.

"Cuba is only in the infancy of its industrial development," said Manuel Balbis, of Cienfuegos, who, with Antonio Capperi, is in America for the purpose of having tests made of certain samples of clay brought from that vicinity. If the clays prove to be valuable for brick and terra cotta manufacture they will purchase a considerable outlay of brick-making machinery before returning.

"In our section of the island," he said, "we are enjoying very prosperous conditions. The crops are good, the demand for our products satisfactory, everything promising. Very slowly brick buildings are coming into favor in the villages. If our clay is good we hope to make a profitable business manufacturing brick.

"Before purchasing we will look over much machinery. We want the best. Most important to us just now is the test result. This will make us wait here a week."

SAND LIME BRICK AND BUILDING BLOCKS.

The above is the title of the latest trade book on this subject. It fully describes the Huennekes System, which is now owned by the Standard Brick Machinery Company, 114 Liberty St., New York. They are a very substantial form of engineers and contractors, especially formed for the construction of sand lime brick plants. The laboratory is at South River, N. J., where Colby M. Avory, one of the best engineers in the country, is in charge.

If you are interested in the manufacture of sand lime brick, it will be far better for you to write to the firm to their New York office and get one of the latest catalogues.

THE MURRAY CORLISS ENGINES.

The Murray Iron Works, Burlington, Iowa, has just issued one of the most complete and up-to-date catalogues on Corliss Engines, Air Pressers, Pumping Engines, Tubular, Water Tube and Internal Furnace Boilers and complete power plants. It is their catalogue No. 56, and is as near complete as any catalogue that ever entered the office of THE CLAY RECORD.

It is the same size as THE CLAY RECORD, contains 72 pages, and is printed on highly calendared paper, well illustrating each* of the different designs of engines and other machinery.

It contains much good information regarding the Corliss engine, lots of data, etc. Yes, you can get one if you are a user of power or contemplate using it.

THE JACKSON PRESSED BRICK PLANT IN NEW HANDS.

L. S. Anderson, who has been identified with the Sand-Lime Brick company of Genesee, Pa., holding the position of secretary and treasurer as well as manager, is now in control of the Jackson (Mich.) Pressed Brick company, having leased the property for one year with the option at the end of that time to purchase or lease for three years. He is making many practical changes, bringing the factory up to date in its equipment. A National ore pulverizer and a Berg press have been shipped to the factory and will be installed at once. It is expected that in ten days the factory will be making brick and employing twelve to twenty men, the old employes being given the preference.

Mr. Anderson says he has discovered wherein the factory has not attained the greatest success, and it is because the sand has not been pulverized fine enough. The sand used has been too coarse. To test out his ideas, Mr. Anderson took some of the sand which is abundant about the factory just south of the city, and pulverized it at his eastern factory and made brick. Comparison was made with the coarse sand brick. It required 951 pounds pressure to crush the coarse sand brick, while the pulverized sand brick withstood a pressure of 2,839 pounds. In the water test the coarse sand brick required but eight minutes to saturate and the pulverized sand brick was not more completely saturated in twenty-four hours. There is an excellent market for brick in Jackson and vicinity, and with the factory newly equipped and in experienced hands, the business is expected to take on renewed life among Jackson industrials.

KEWANEE BRICK PLANT TO BE STARTED AGAIN.

For the purpose of manufacturing and marketing brick, a new company has been organized by a number of Kewanee, Ill., men and the plant of the Mining and Manufacturing Company has been leased. The company will be known as "The Kewanee Brick Co." and the newly-elected officers are:

President—R. E. Taylor.
Vice President—George Wilsey.
Secretary—William Stanley.
Treasurer—Moritz Roth.
Manager—E. A. Mumford.

A number of the officers are practical brick-makers who have had experience in the business and who are familiar with the industry in all details. The plant will be operated in harmony with the brick-workers' union.

The buildings, kilns and whatever else that is useful remaining from the plant of the Kewanee Mining and Manufacturing Company will be utilized by the new company, which will add all other equipment that is necessary to carry on the industry under the best possible conditions. A modern brick-making machine has been purchased and will be set up immediately. The brick-making machine of the old plant was destroyed in the fire which visited the plant.

Men are already on the ground, getting the preliminary work out of the way, and it is expected that the brick-making will commence not later than the middle of the present month.

The plant will turn out between one and two million brick this season, and as the demand here will be brisk this year, for building brick, it is believed that there will be no difficulty in marketing all the product at home.

INDEPENDENT BRICK INTERESTS TO CONSOLIDATE.

Pittsburg.—Two large Chicago independent brick manufacturing plants have signed agreements to join the consolidation of these interests being formed here. In all, fifty-six plants in the country have agreed to consolidate, and when the merger is finally completed it will include sixty independent companies. Appraisers are completing inventories of the plants and auditors also preparing data, all of which will be presented at a general meeting of the affiliated interests to be held here this month. The capitalization of the holding company will be in the neighborhood of \$15,000,000 and general offices will be established in Pittsburg.

No. 59 CONICAL ROLL CLAY CRUSHER.

Bulletin No. I, containing a faithful illustration, a complete description and full specifications of the new No. 59 Conical Roll Clay Crusher, which has been recently added to the varied line of clay working machines manufactured by H. Brewer & Company at Tecumseh, Mich.

If you are interested in this Bulletin or in clay-working machinery in general, you may get considerable valuable information by calling for it or the 1906 Forty-seventh Annual Catalogue.

3,500 MEN GO OUT AT KINGSTON AND VICINITY—WANT UNION RECOGNIZED.

Kingston, N. Y., May 15.—All the brickyard hands in this vicinity went on strike this morning because the brickyard owners refused to grant their demand for recognition of the union. President Hanks and other officers of the International Brick, Terra Cotta and Tile Workers' Union have been here for three weeks endeavoring to adjust the troubles. Not being successful, they ordered the strike. The yards affected employ over 3,500 men, and make, when running, 6,000,000 bricks a day.

About one thousand Southern negroes are among the strikers, the other strikers being Italians, Hungarians, Austrians and Poles.

The demands of the International Brick, Tile and Terra Cotta Workers' Union follow:

First—Twenty-two thousand brick to constitute the output of a single machine, working with one gang. The present output is twenty-four thousand. Working with a gang and a half, the output to be restricted to thirty-three thousand brick per single machine. The manufacturers object to this restriction, as it would work a hardship to the maker and cut down his sales materially. On a yard working several machines the decrease of 2,000 a day per machine will cut off a large per cent of the profits without giving much relief to the workingman. On the other hand, the workers claim the output is entirely too large and causes much hardship to accomplish it.

Second—An increase of ten cents per day in wages.

Third—Men watching at kilns at night to receive \$1.25 for a half night's work.

Fourth—Boatmen to receive \$40 per month and board and no other work required of them.

Fifth—Ten hours to constitute a day's work, with a half an hour for breakfast and one hour for dinner.

Sixth—All workmen on the yards to be members of the International Brick, Tile and Terra Cotta Workers' Union.

The last demand is the one which has proved to be the stumbling block to a peaceful consideration by the manufacturers of the other side of the question. It was like flaunting a red rag at a bull. The makers are agreed that there will be no consideration of any demands which include recognition of the union. With that eliminated there was a chance that the other things, with the exception of a decrease of output, might be granted. But at present there remains no possible solution of the difficulties, for the union officers say the demand will not be withdrawn. One of the officers of the union said today that there was a chance of a strike, but added that every effort would be made to settle the differences without resorting to that method. The manufacturers are very reticent, but hold out little hope of a settlement.

H. M. Deavitt, who is an expert chemist for more than one hundred well known firms, has moved his office and laboratory to 56 Fifth Avenue, Garden City Block, Chicago. Analyses on clay, sand, cement, or lime are a specialty, and special boiler compounds are made.

SAND OR LIME BRICK OR BLOCK NEWS.

Lee Stover is making colored cement pressed brick at Watertown, S. D.

F. D. Cunningham, the contractor at Fulton, Mo., has started making cement brick.

The Laughray Concrete Brick Machine Co., Bay City, Mich., has been incorporated with \$25,000 capital.

J. A. Mahoney, Deming, N. M., has secured machinery and has commenced making cement brick.

The Holland (Mich.) Brick Co. is behind with their orders for brick and the force will be materially increased so as to catch up.

Steady progress is being made on the Sand-Cement Brick Co.'s plant at Glen Falls, N. Y. Actual operations will begin in June.

W. F. Conrad, 928 W. 32d St., Indianapolis, Ind., has patented a sand cement brick machine that with six molds makes 40,000 brick daily.

Dr. Russell G. Paris has commenced an action against the Mohican Brick Co. at Fort Edwards, N. Y., to foreclose on the plant, real estate, etc.

The Tri-City Sandstone Brick Co., Moline, Ill., has resumed operations at their plant, with orders for over a million of brick on hand.

Representatives of a large Eastern sandstone brick manufacturing concern are at Macon, Ga., investigating the prospectus of building at Macon.

The Virginia Granolithic Building Block Co., 1321 West Main St., Richmond, Va., are in the market for machinery for making sand-lime brick.

M. L. Ortelieb and John I. Hancock are at present engaged in the organization of a company to manufacture hollow concrete brick at Leistershire, N. Y.

The Ideal Pressed Brick Co., Detroit, Mich., has filed articles of incorporation with \$5,000 capital stock. They will manufacture brick by a secret process.

The Federal Granite Brick Co., of Scranton, Pa., has decided to double its working force at both the Scranton and Sayre plants on account of the rush for orders.

The Standard Cement Brick Co., South Bend, Ind., has been organized with \$6,000 capital stock. Directors are: George J. Hoffman, August H. Jordan and William A. Wiegand.

The Borst Block and Brick Co., Akron, Ohio, has been incorporated with \$10,000 capital stock, by C. H. Borst, A. K. Fausen, Walter T. Flower, E. S. Bunnell and Clyde F. Beery.

The Roseton (N. Y.) Sand Lime Brick Co. has been incorporated with \$120,000 capital stock. The directors are H. A. Bartlett, C. L. Waring, Amos F. Holden, and T. F. Chadwick of Newburg, and Patrick Lynch of Blackstorm.

The Oshkosh (Wis.) Sand Brick Co. has been incorporated with \$75,000 capital stock. They will make sand lime brick. Peter L. Marden is president, Julius Kiel vice president, Benjamin H. Doughty secretary, and Frank J. Barber treasurer.

MISCELLANEOUS ITEMS.

Len Stroud of Mabel, Minn., is moving his brick plant to Preston, where he has bought land and will operate same.

Mr. James W. Buttermore, Connellsville, Pa., is putting in a "Martin" Latest Improved style "A" Machine with double mould entrance.

Mr. Edward A. Schuesler, Buffalo, N. Y., has ordered from the Henry Martin Brick Machine Mfg. Co., of Lancaster, Pa., an all iron and steel style "P" Brick Machine.

The Barron Dryer Co., formerly at 225 Dearborn St., Chicago, have moved their office to suite 310-211 Oxford Bldg., 84 La Salle St. The company has a large amount of work on hand at the present time.

Frank Pierson, Adam Saale and Frank Way have leased for two years the brick and tile plant of the Chillicothe (Mo.) Brick Co. They will operate as Frank Pierson & Co., and will make several additions to the plant.

The Stuyvesant Brick Co., Stuyvesant, N. Y., are putting in three "Martin" Latest Improved Style "A" Machines, each fit up complete with Pug Mill, Elevator, and Sander, furnished by the Henry Martin Machine Mfg. Co., of Lancaster, Pa.

The local citizens at Payville, Mo., want a brick works and will supply the capital and want a brick maker to run the plant. Wesley Merritt, industrial agent of the A., T. & Santa Fe Railway, Railway Exchange Building, Chicago, can give information.

Wesley Merritt, industrial agent of the A., T. & Santa Fe Railway, Chicago, Ill., informs us that Marietta, I. T., wants a brick making plant, that conditions are good for a first class plant. The citizens will invest from \$15,000 to \$20,000 with a practical brick man.

Mr. John W. Goulding, Trenton, N. J., is installing a "Martin" outfit, including "Martin" Latest Improved Style "A" Machine, with Pug Mill, Disintegrator, Elevators, etc., complete, purchased from the Henry Martin Brick Machine Mfg. Co., of Lancaster, Pa.

The East End Brick Works, East Catasauqua, Pa., are greatly enlarging their plants and are changing the "Martin" Horse Power Brick Machines to Steam Power and will fit the Machine up in combination with the "Martin" Pug Mill, Elevators, Crushers, etc.

The Black Hawk Clay Mfg. Co., Sears, Ill., has just re-organized with \$80,000 capital stock. The officers are: M. Rothchild, president; Charles S. Englebrecht, vice president and manager; and Ed. Berger, secretary and treasurer. A new Boyd Dry Press has been installed. The office is in the Lane Bldg., Davenport, Ia.

Mrs. J. H. Brown, Fort Salunga, N. Y., is installing a "Martin" outfit complete, including the Brick Machine, Pug Mill, Elevators, Crushers, etc., together with the Latest Improved "Martin" Patented System of handling and drying soft mud brick, all of which is to be installed by the Henry Martin Brick Machine Mfg. Co., of Lancaster, Pa.

William Cooper of Meadows is making arrangements to establish a brick making plant at Council, Idaho.

S. K. Leacox, Keota, Ia., is building new kilns and adding machinery so as to double the capacity of his plant.

The stockholders of the Seward (Pa.) Brick Co. elected George H. Preston, president; C. L. Ferguson, vice president, and C. C. Pfordt, secretary and treasurer.

The Hudson Brick and Cement Co., New York, has been incorporated with \$20,000 capital stock. Directors are: J. W. Gannon, Nat Taylor Jr., H. C. Vervalen.

William A. Shull, of Vinton, O., is examining the Teays Valley, Putnam Co., W. Va., fire clay strata with a view of locating a plant to manufacture fire clay products.

The Rensselaer (N. Y.) Brick Co. has elected A. H. Ostrander, president; Homer L. Brayton, vice president; R. A. Rollins, treasurer, and James D. Henderson, secretary.

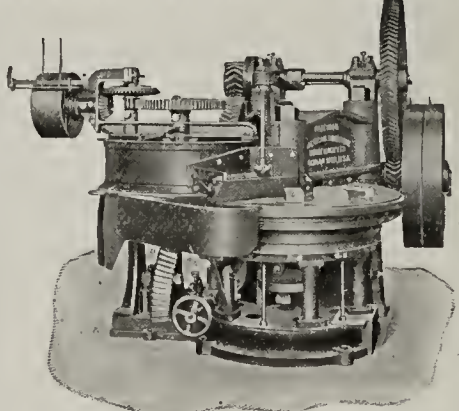
The Patuxent Brick Co., Alexandria, Va., has been incorporated with \$100,000 capital stock by Charles Childs, president; F. J. Coleman, secretary; A. J. Curtis, treasurer; all of Washington, D. C.

The Humboldt (Neb.) Brick Co. are getting their new brick works in readiness for manufacturing brick. Former Postmaster Bantz is the manager and C. L. Snyder, formerly of Versailles, Mo., is the yard superintendent.

The Danville (Ill.) Brick Co. is opening up a coal mine near the plant in Vermilion Heights and will mine its own coal. The plant began operations the first of the month, after a thorough overhauling and a shut-down since November.

The Hauerwas Brick Works at Florence, Ala., has been bought by a company capitalized at \$12,000. The officers are: F. D. Green, president; S. P. Merrill, secretary and treasurer; and U. S. Hauerwas, general manager. It will be called the Florence Brick Co.

Paul Schneider has leased for 50 years on a royalty 48 acres of land near Bedford, Cuyahoga Co., Ohio, to Gustav A. Wagner, who will erect a brick plant on the property at once, which will have a capacity of 100,000 brick daily. The deposit contains a 36 foot vein of yellow clay and 40 feet of shales.



The American Sandstone Brick Machinery Co.
Saginaw, Mich.

One of these presses made 22M. brick each consecutive day of ten hours for more than six months without a breakdown. Another press made 4,235,000 the first ten months, ten hours per day run; is now making 35M. per day, day and night run. We were the first to introduce the Komnick or hydrated lime system in the United States; also to build and

KOMNICK IMPROVED ROTARY PRESS.

install the complete plant and guarantee results, and are prepared to furnish complete or partial installation.

John W. & F. F. Morgan, and other citizens are considering the starting of a brick making plant at Marietta, O.

The Sharon Coal and Brick Co., Georgetown, Ill., has been incorporated with \$30,000 capital stock by H. W. Morris, P. H. Smith and R. W. Fisk.

W. H. Burland and Charles Varian, St. Anthony, Idaho, are preparing to put in a brick plant on the old site west of town. Mr. Varian will be manager.

The Unique Brick and Tile Co., Portland, Oregon, has been organized with \$20,000 capital stock by B. F. Hoover, A. F. Hoover, Henry Black and H. Hanni.

Chicago and Toledo capitalists are arranging to start a clay roofing tile plant at Brazil, Ind. The site secured is underlaid with fine clay and shale and a good vein of coal.

The Grinnell (Ia.) Brick and Tile Co.'s plant is going rapidly forward under the management of C. A. Smith. The Richardson-Lovejoy Engineering Co., of Columbus, O., are furnishing the plans.

The Simons Brick Co., Los Angeles, Cal., have bought 100 acres of ground of the El Carmel tract and propose to move their plants to this site and make an industrial town. The company employs 400 men.

The plant of the Southern Sewer Pipe Co., in North Birmingham, Ala., will be doubled in capacity. The plant now employs several hundred hands, and with the new addition will be the largest in the South.

The Dublin (Ga.) Brick and Lumber Co. has been incorporated with \$25,000 capital stock. The plant will be located on the Oconee River, S. H. Fuller is president, B. M. Grier manager, and L. H. Beacham secretary and treasurer.

The Cormack property in the Hudson River at Port Ewen, N. Y., has been sold to New York builders, who will put up a brick making plant running same by electricity. B. Bergman, a practical brick man for 40 years, will have charge of the building and arrange the yard.

The directors of the Pocono Brick Co. met in Stroudsburg, Pa., and elected Otto Ruhlman, president; E. C. Arnold, secretary, and Mahlon Wolbert, treasurer. The new company is capitalized at \$20,000 and assumes control of the old brick plant of Scott Run, the capacity of which will be greatly increased.

A RARE OPPORTUNITY.

One thousand acres of "Fire Clay" with lignite coal in abundance on adjoining land. Clay of the following analysis with a vein running from four to forty feet. Some of it shows the same analysis, except has much less sand.

ANALYSIS:

Telephone Connection.

CHEMICAL LABORATORY,
H. ENDEMAN, PH. D.
Analysis, Consultations and Researches.
23 William Street, New York, Aug. 9, 1904.

CERTIFICATE OF ANALYSIS.

For F. M. Greene, Atlanta, Texas.

I have examined the sample of Clay marked as stated below and find the following results:

It contains in 100 parts by weight—

Alumina	19.88	} CLAY
Silica	20.95	
Hydrate water	6.03	
Oxide of iron	0.74	
Alkaline earths and alkalis	2.22	} SAND
Coarse sand (sample	35.00	
Dust sand	15.18	

This clay situated in Texas. Would like to put it in as stock with good people to develop it. Samples and full particulars on application.

F. M. GREENE, ATLANTA, TEXAS.

B. E. Brown of Pocatello, Idaho, has started a brick yard at Joseph, Oregon.

The Clermont Brick and Tile Co., Biloxi, Miss., are in the market for brick machinery. J. A. Bradus is secretary.

Plans have been perfected for a new fire brick plant at South Webster, O. W. J. Mossbarger is one of the promoters.

Winterset, Iowa, is to have a tile plant. Thomas Mardis, Fred Mardis, S. D. Alexander, Ed. Orris and others are interested.

The Duquesne Brick Co., with \$50,000 capital stock, has been incorporated in Trenton, N. J., by S. Hunt, E. L. Kern and A. Nuernberg, all of 147 State St.

John P. Hatch and others of Chicago will build at Manteno, Ill., a \$60,000 brick plant. Mr. Hatch has been a brick maker in Chicago for 25 years.

The Coxey Egyptian Stone and Brick Co., Mount Vernon, Ohio, which is owned by J. S. Coxey, has contracted for machinery necessary for making brick.

R. E. Pray and A. L. Smith as Pray and Smith, Greenfield, Mass., will operate the plant in that city. Mr. Smith will also operate the plant in Northampton.

The Benson Brick Co., Cohoes, N. Y., has been incorporated with \$20,000 capital stock by Martin & John Benson, Edward Penrose, Harmon Eggers and Michael Murphy, all of Cohoes.

The Iowa Enamel Brick and Stone Co., Des Moines, Ia., have leased a plant on South 9th St., and will have their plant in operation in a short time. W. H. Langan is president and Frank Stehn manager.

At a meeting of the stockholders of the Grand Forks (N. Dak.) Brick, Tile and Cement Co., M. F. Murphy was elected president, William Burge treasurer and Joseph R. Poupouse manager. The company is building a plant north of the city.

Read & Read, Mount Carmel, Ill., have just bought the brick and tile plant of M. L. Tilton on West 6th St., and will consolidate same with the North Main St. plant. A new dryer will be put in, so that the plant can be run all winter.

BUILDING SUPPLIES WANTED

The wonderful progress of Northwest and Western Canada has created a tremendous demand at

WINNIPEG

for all classes of Building Material. We reach every Architect, Builder, Contractor and Engineer in Northwestern and Western Canada. We reach every Brick Yard and Clay Worker. Write us for full particulars, etc.

\$1 a year keeps you posted.

WESTERN CANADA CONTRACTOR

720 Union Bank, WINNIPEG, CANADA.

CLAY RECORD.

WANTED TO NEGOTIATE.

The undersigned owns 60 acres of land immediately upon the the Great Texas & Pacific Railway, west of Fort Worth, Texas, 47 miles, and 79 from Dallas, Texas, upon which there is a mountain of 20 acres of as fine brick and tile shale as can be found anywhere. Thickness of shale 40 feet above ground of valley surface, and thicker still below. Makes a cherry red brick. Wish to have a strong company formed and will take stock. Convenient to coal and water. Fine sale for product. Invite correspondence.
E. W. MORTEN,
Farmersville, Texas

FOR SALE.

An interest in my tile and brick plant, to one of experience, that can take charge and run it. Must be able to invest some money in plant. Plenty of good clay at back door, and good market at front door. This is an opportunity that you don't often run up against. Plant now running. Come and see or write

S. H. RECORD,
Charleston, Ill.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

FOR SALE.

Profitable running brick plant, 25,000 capacity. Ready sale for entire product. Owner has larger interests requiring attention

TERRA HAUTE PRESSED BRICK CO.
Terra Haute, Ind.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address
T, care Clay Record,
Chicago, Ill.

BRICK YARD FOR SALE IN GAS BELT.

A fine brick yard for sale. Dry Press. Everything new last year. Five up-draft kilns. Making money. Fine shale bank. Can make brick cheaper than any yard in Kansas. Reason for selling one of the partners has large oil interests in Indian Territory. Will give time on part of price. Making 30,000 brick daily and ready sale. Address

A. B., care Clay Record,
Chicago, Ill.

FOR SALE.

A second-hand Four-Mold Dry Press. Has not been used more than a year. Good condition of repair guaranteed. Also good second-hand 44-inch Pulverizer. Address

BOSTON,
Care Clay Record, Chicago, Ill.

POSITION WANTED.

Wanted, position as foreman or manager of a Dry Press Brick Plant of not less than 20,000 brick per day. A number of years experience. Address

ELLIS,
Care Clay Record, Chicago, Ill.

FOR SALE.

Chambers End Cut Brick Machine, capacity 3,500 brick daily. 75 double deck roller bearing stiff mud brick cars.

STEELTON & HARRISBURG BRICK CO.
Steelton, Pa.

PARTNER WANTED.

A good, reliable man of experience, with some capital to invest in and take charge of a new Dry Press Brick Plant. Plenty of shale, and good market for all the brick. Address

DENIS, care Clay Record,
Chicago, Ill.

WANTED.

A man who understands brick making in all its branches, and who has \$5,000 to \$10,000 to buy an interest in a large brick plant in the West, and take complete charge of same at a good salary. Plenty of business at good prices; no competition. Owner has other business and wants some one interested who can run the plant. Address,
"West," Care Clay Record, Chicago.

Machinery For Sale.

FOR SALE CHEAP.

One Atlas Engine, 35 horsepower. One Atlas Boiler, 50 horsepower. One Hercules, Sr., No. 108 Brick Machine. On Sander. One Turn-table. One 20 barrel Galvanized Iron Tank for washing moulds. One 4-spring Truck. Three Hand Wheelbarrows. Six Brick Wheelbarrows. One Disintegrator, Belting, Shafting, Pulleys. 85 Brick Moulds. 44 Iron Kiln Doors. 175 Kiln Grates. All of this property is nearly new and will be sold at a great sacrifice. For further information, write to A. J. WARD,
Holland, Mich.

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address
"GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.

THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new. DEALER,
Care Clay Record, Chicago, Ill.

MACHINERY WANTED.

Second-hand 9-foot dry pan, screens, elevators, pug mill, large size Chambers' brick machine, belting, pulleys, cable and dump cars. Also 150 to 250 h. p. Corliss engine, and two 100 h. p. boilers.

J. O. C., care Clay Record, Chicago.

FOR SALE.

A brick and Tile plant, equipped with up-to-date machinery, 60,000 daily capacity, down draft kilns, inexhaustible bed of best clay suitable for all kinds of building, facing and paving brick, drain, tile, sewer pipe, etc., on two railroads, demand very good. Address
B, care of Clay Record.

FOR SALE.

A going, money-making hollow block plant. Best location in Ohio. Also well equipped for face, common, paving and common brick. Includes coal mine and 125 acres of four foot Cambridge coal, overlaid with shale and underlaid with fire clay. Good prices and more orders than can be filled. Plant comparatively new and in excellent condition. Will be sold at \$40,000, two-thirds original cost, one-half cash and one-half credit. Good reason for selling. Address
THE GUERNSEY BRICK & CONSTRUCTION CO.
Cambridge, Ohio.

FOR SALE.

2,000 ft. 12-lb. steel rails, used one season. 11,000 32-in. x 9 1/4-in No. 1 White Pine Pallets. One set Brick Moulds, new, 9 x 4 1/4 x 2 1/2 inches. One 48-in. Leviathan Belt for Potts' Sander, new. One Potts' Dump Table, used one season. RIVERSIDE BRICK CO.
Green Bay, Wis.

FOR SALE OR TRADE.

One Standard Brick Machine, steam power, 30,000 capacity. 24 new Brick Moulds. 11,000 Pallets. Three Off-Bearing Trucks. All in first-class condition. Owner, E. J. SWARTZ & SON,
Syracuse, Ind.

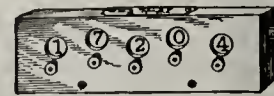
FOR SALE.

One Model "B" Four-Mould Dry Press, used only a short time, thoroughly overhauled.
Model B, care Clay Record, Chicago.

PERFORATED METALS

for all purposes
Prompt shipment of all orders guaranteed.

H. S. SIMPSON,
817 Chamber of Commerce
Chicago, Ill.



Paper Joggers quoted.

R. A. HART, 41 White St., BATTLE CREEK, MICH.

No better made, run from \$8 and \$10, to

4 Wheel, \$3.00

5 Wheel, \$3.25

Guaranteed.

Sold by all dealers

FOR SALE CHEAP.

First-class brick and tile plant. Good machinery. unlimited clay supply, 25,000 capacity daily, 3 kilns 170,000 capacity, dry sheds, etc. Track connections, A snap if taken at once. Address

H. C. MODLIN, Secretary,
Perry, Iowa.

ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

FIRE CLAY LANDS.

500 acres underlaid with heavy vein superior fire clay and light vein coal, which can be mined cheaply, on the line of the N. Y. C. & H. R. R. R., in Pennsylvania, for lease on royalty at low price per ton. For further information address the owner.
BOX No. 308, Williamsport, Pa.

FOR SALE OR EXCHANGE.

One of the best small brick and tile plants in Southern Michigan. 20,000 capacity, Stewart patent kilns, good drying sheds, all machinery in first-class condition, fine clay, good market. Will sell at a bargain or will exchange for good real estate. Address,
MICHIGAN,
Care Clay Record, Chicago

STEAM SHOVEL FOR SALE.

Barnhart style "B," good condition, large enough to dig clay for 100,000 brick in 8 hours. Apply to
ILLINOIS BRICK COMPANY,
918 Chamber of Commerce,
Chicago.

FOR SALE.

One 5-ft. Style American Dry Pan, practically new. One 10-hp. Gasoline Engine, complete. KIAMENSI CLAY CO.
Newport, Del.

9-FT. DRY PAN WANTED.

We could use another Dry Pan and will buy at once if good and cheap. Will buy 25,000 capacity Stiff Mud Machine and Pug Mill and Dunlop Screen. GOETZ PRESSED BRICK CO.
New Albany, Ind.

SETTER WANTED.

A first-class brick setter. State age, experience, reference and salary expected.
Box M, Nesbikoro, Wis.

SAND LIME PLANT.

Huennekes System Plant, including best Four-Mould Boyd Press, Jeffrey Sand Dryer and Conveyor; all practically new and in good condition; will be sold at less than half of construction cost. Address, SAGINAW PRESSED BRICK CO.
Saginaw Mich.

FRANK TOOMEY

127 and 131 North Third Street.
PHILADELPHIA, PA.

Great	Assortment,	3,200	Pieces.	ENGINES,	CORLISS.	Automatic,	Steam	Slide Valve,	Pumps,	Dynamos,	General	Machinery of	all kinds	Rebuilt and	Guaranteed.	Immediate	Delivery.	Send for	List of Stock
-------	-------------	-------	---------	----------	----------	------------	-------	--------------	--------	----------	---------	--------------	-----------	-------------	-------------	-----------	-----------	----------	---------------

Brick and Mortar Coloring

After twenty years "Clinton" colors still stand at the head. Get the genuine, with the "Little Yellow Side-Label."

CLINTON METALLIC PAINT CO., Clinton, N. Y.
CORRESPONDENCE SOLICITED.

WARNING

NOTICE is hereby given that the process of drying and burning brick by first setting green, undried brick in horizontal courses in a kiln to form a layer thereof, then covering and drying such layer, and successively coursing, capping and drying separate layers of green, undried brick upon the last dried layer until all the layers are thoroughly dried, and then burning, is patented in U. S. Letter Patent No. 485199 to J. C. Kenzel, dated Nov. 1, 1892, and all persons are hereby warned against using such processes without grant or license from the undersigned owners of said patent. Unauthorized use of the patented process will render the user liable to an action for infringement and the payment of damages to the owners of the patent, whose rights thereunder will be strictly enforced.

J. C. KENZEL,
J. S. KRAUSS,

P. O. Box 271.

128 Logan St., Knoxville, Tenn.

Refractory Cement

(So called because it is worked the same as cement)

A high refractory composition that can be used the same as cement, cured and put to use in twelve to twenty-four hours, and will endure any degree of heat that fire-clay products will.

Applied to the inside of a kiln it will protect the walls and give increased refractivity; will reduce the cost of repair, and save fuel in any kiln.

Every boiler furnace should be lined inside with "Refractory Concrete." It will protect the walls and increase the heating capacity by preventing radiation.

For insulating steam pipes this composition is guaranteed equal to asbestos or magnesia felt; the cost per foot to cover a 3-inch to the thickness of 1 inch will be 4c.

Refractory brick of a high order can be formed from the composition on any cement brick machine.

For flue linings, chimney blocks and tops, floor and partition blocks, conduits for electric wires, etc., this is the ideal material.

Refractory Concrete can be combined with any aggregate used in the formation of cement products.

For information pertaining to your particular requirement, and prices, address.

E. R. STOWELL
NEW CORYDON, INDIANA

The Burlington Route

calls attention to manufacturers seeking a new location to its Industrial Department. This department is established for the benefit of manufacturers. Information on the three Rs of manufacturing—Power, Raw Material, Market—can be had by writing



W. H. MANSS,

Industrial Commissioner,

209 Adams St., CHICAGO.

CLAY RECORD IS A SEMI-MONTHLY

NOW READY—A TREATISE ON

PRODUCER-GAS and GAS-PRODUCERS

BY AN ACKNOWLEDGED AUTHORITY.

A 300-page book containing thirty chapters, giving the fundamental principles and definitions, calculations, classifications, manufacture and use; the fuel, the requirements, the history, its by-products, Producer-Gas for firing kilns, steam boilers, and power plants. The future of the Gas-producer and a bibliography.

OVER 100 CHOICE ILLUSTRATIONS—PRICE, \$4.00.

A subscription to the CLAY RECORD for one year without additional charge to those that are not now subscribers.

CLAY RECORD PUBLISHING COMPANY

CHICAGO, ILL.

**A NEW CLAY FEEDER AND MIXER**

The Rust Clay Feeder has been brought out in response to a better method for mixing and feeding clay in brick, tile and all clay working plants. By the use of this feeder the services of two men are entirely dispensed with, the clay being dumped into hopper of machine from car is automatically fed into the disintegrator. The spirals draw their supply evenly from all parts of the hopper, mixing the clay perfectly, which tends both to improve and increase the output of the plant.

Send for full descriptive circular.

Marion Machine, Foundry and Supply Co.
Marion, Ind.

Something New In Brick Kilns and Dryers



The Dennis Double Chamber Up and Down Draft Brick Kilns and Direct Heat and Hot Air Brick Dryers show many new features that make them superior to all others. Economical, durable and strong in construction and operation, having many points of advantage that appeal to practical brick-makers. Patented April 14, 1903 and September 8, 1908. Brick plants installed and put in operation. Write for booklet. Correspondence solicited.

F. W. DENNIS,
145 Water St., Norfolk, Va.

Robert F. Wentz, M. W. S. E.

701 National Bank Building, Allentown, Pa.

DESIGNER AND BUILDER OF

Cement and Sand-Lime Brick Plants, Analysis, Tests, Examinations, Reports, Preliminary Plans, Estimates and Complete Drawings and Specifications for Modern Cement and Sand-Lime Brick Works.

We have designed, built and reconstructed twenty-two Cement Plants in the past twenty years.

We design and equip complete Cement and Sand-Lime Brick Plants with the most modern machinery.

THE HYDRO - MALAXATOR PROCESS for the manufacture of Sand-Lime Brick.

Absolutely safe and reliable. Ask your friends

A WOODEN TOWER

Is a source of annoyance and danger. It is liable to rot and collapse at any time. A

CALDWELL STEEL TOWER

is safe, staunch and durable and will carry four times the weight of the filled tank. Expensive labor is not necessary to erect these outfits, your own men can do it. We furnish all plans.

Send for illustrated catalogue and price list.

W. E. CALDWELL CO., - Louisville, Ky.

How to Use Portland Cement.

From the German of L. Golinelli.
Translated by Spencer B. Newberry, E. M., Ph. D.
A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.

22,000 copies sold in Germany.

Portland Cement Sidewalk Construction.

Compiled by P. B. Beery, and based upon the experience of many successful contractors.
A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.

FIRE! FIRE!! FIRE!!!

THE "CHILDS" FIRE EXTINGUISHERS APPROVED

and included in the list of approved extinguishers issued by the

National Fire Protection Association

SALESMEN WANTED

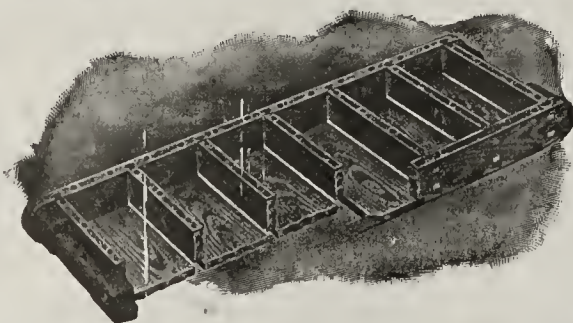
O. J. CHILDS CO.

Sole Mfrs.

UTICA, N. Y.



PERFECTION BRICK MOULDS



These are the kind of Brick Moulds the Brick Makers have always wanted but could not get till now. You can get a mould that the vents are right all the time. No change whether the Mould is wet or dry. Try a sample order. Satisfaction guaranteed.

PATENTED JAN. 28, 1902.

THE ARNOLD-GREAGER CO.

Manufacturers of Brick Machinery and Supplies of all Kinds.

NEW LONDON, OHIO.

Brick Moulds and Brick Barrows

With Moulds and Barrows it is not the first cost, but it is, will they last? We have made them for over 30 years and know your wants. All kinds and shapes. A trial order will convince.

James B. Crowell & Son,
Wallkill, N. Y.

H. M. DEAVITT,
PRACTICAL AND CONSULTING CHEMIST,
Garden City Block,
CHICAGO.

Analyses of Clay, Sand, Lime, Cement Materials and Shales a specialty.

Special attention given to the preparation of Clay Products from the raw material.

A well equipped laboratory and long experience in this branch of work enables us to give expert reports on obtaining glazes on refractory materials.

All enquiries in regard to the above will receive prompt attention.



Vol. XXVIII. No. 10.

CHICAGO, MAY 31, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

MAGNESIA BURNING AND MAGNESIA BRICK.

The comparatively youthful magnesia industry has made such strides during the last few years that we believe our readers will be interested in some information we have been able to obtain on this subject.

Although found in almost every part of the globe, magnesite, or magnesia stone, only occurs in sufficiently large quantities to pay for its extraction in the east of Europe, in South Africa, and in California. The European magnesia stone is chiefly obtained from Syria, Hungary, and Greece, the South African from the Transvaal district, and the Grecian from Eubœa. Attempts to use the large deposits in the neighborhood of the Ural mountains have not, to the present, met with much success.

The most famous magnesia quarry is that of the Veitsch Magnesia Co., in Syria, which, in spite of many attempts to absorb or ruin it through various trusts, still continues to work at a considerable profit to its owners. In Hungary there are many quarries, but these are mostly small, and were started some years ago when the market was in such a state that the search for magnesia has been compared to the Californian gold rush of some forty years ago.

The raw magnesia ore often contains dolomite and quartz, as well as numerous varieties of magnesium silicate, so that it is invariably necessary to pick it over carefully in order that these foreign substances may be removed as completely as possible. This is more especially the case when the ore contains fusible materials, or materials which can unite with it to form a vitrifiable mass.

The ore is removed from its bed by blasting and quarrying in a manner similar to ordinary stone, and is then broken into pieces the size of a man's head. These "balls" are then examined by the "picker," who removes the foreign earths and stones as much as possible, and only sends to the works the portions which he judges to be sufficiently pure. It is, therefore, of the greatest importance that the "pickers" should be thoroughly conscientious and reliable men, as much of the success or failure of the works depends

on the care and skill they exercise in the cleaning of the stone.

The kilns for vitrifying the magnesia stone are either cupolas heated by coal and an air blast, or gas-fired cupolas in which the fuel is first converted into a crude kind of producer-gas before being admitted to the kiln. The latter give a much purer product.

The well known Mendheim kiln (which is a gas-fired kiln somewhat on the Hoffmann principle) and ordinary continuous kilns are also used, but there is always some difficulty in gaining a sufficiently high temperature to properly vitrify the mass.

The "setting" of the stone in the kiln varies, naturally, with the particular kind of kiln employed, but in all cases the material must be stacked in such a way that the hot gases can traverse it without much resistance. As the stone loses a large proportion of carbonic acid gas on being heated, the filling of the kilns is a matter requiring considerable skill, for the material shrinks and settles during the firing, and is exceedingly liable to slip and choke any air passages which may have existed when the kiln was first filled. In order to utilize as much of the heat as possible, the top 20 to 30 in. of stone are set somewhat more closely than the rest, and every care is taken to get as much material into the kiln as is possible without unduly diminishing the draught, because even the best stone yields less than half its weight of magnesia on burning, and the ordinary magnesite rock only produces about 45 per cent. of its weight of magnesia, even when worked under the best conditions.

In cupola kilns the firing has to be watched with especial care as the tendency of the magnesia to bind into lumps and to adhere to the sides of the kiln is very great, and may easily cause a stoppage of the firing. This tendency to agglutinate is greatly increased by any siliceous material which may be present in the stone, and it is on this account that the preliminary sorting and removal of foreign material must be carried out with such care. All repairs to the kiln, which in clayworking are usually made with sand or clay, must in the case of magnesia burning be made with

magnesia, and ashes from the fuel used in firing are also the cause of a serious loss of value to the product, so that gas-fired kilns are now rapidly coming into use quite independently of their relative cost.

The temperature of the kiln varies in different works, and is really dependent on the purity, or otherwise, of the material being burnt. The temperature corresponding to Seger's cone No. 17 is usually considered rather low; cone No. 24 is a fair average, but in some works even higher temperatures are reached.

In some works the completion of the burning of the magnesia is never attained, and for some purposes it is preferred to the fully burnt material, particularly for the manufacture of magnesia bricks, though magnesia, with a volume weight of less than 2.175, is not suitable for this latter purpose, as it would contract too much in the subsequent firing.

When drawn from the kiln the burnt magnesia is dark chocolate brown in color, but the partially burnt portions are much lighter in color, and can thus be easily sorted from the rest. The burnt stone must be carefully kept from all moisture, which it rapidly absorbs from the air if left exposed for any length of time. Hence no more should be taken from the kilns than can be immediately worked up into bricks or stored in a perfectly dry place.

For grinding the clinker machines similar to those used for Portland cement clinker are employed. The lumps are first reduced in a stone-breaker or disintegrator, the smaller pieces are then passed through a pair of crushing rolls set somewhat widely apart, and the final grinding is carried out in a ball-mill or a pendulum-mill fitted with ample dust-removing appliances.

The ground clinker greatly resembles emery both in color and sharpness, and is extremely dangerous to the workmen employed in its production. Its hardness is so great that it rapidly wears away the grinding surfaces of the machinery, so that its production is apt to be costly if cheap machines of low-grade steel are used for its reduction.

For the production of good magnesia bricks certain qualities are necessary in the clinker of which they are made, and unless these characteristics are present serious defects will be observable in the finished bricks. Hence, additional precautions are necessary in making bricks to those needed in making the ground magnesia meal. Thus, the bricks being invariably required to possess the greatest possible refractory power, it is essential that the kiln in which the clinker is burnt should be lined with magnesia bricks wherever the charge of magnesia can possibly touch it—siliceous matter being attacked at the high temperatures used to such an extent as to seriously lower the melting point of the clinker produced. It is also necessary for the rest of the kiln to be built of the best and most refractory fire-clay, or of Dinas bricks, and in many instances it is found cheapest in the end to build all the parts of the kiln which are exposed to heat of magnesia bricks with a fire-clay backing to give added strength.

The characteristics sought for in the best class of magnesia bricks are: great refractoriness, a high percentage of

magnesia, great mechanical strength, comparative lightness (in other words, a porosity of 20 per cent.), and a specific gravity of 3.03 to 3.05.

These characteristics are obtained as the result of the most careful attention to each step of the process of manufacture, viz.:—

1. Breaking up the clinker into moderate sized pieces by means of a stonebreaker.

2. Sorting of the broken clinker and removal of the impurities, such as dolomite, quartz, large grains of pikrosmin (a variety of asbestos which is commonly found in native magnesia ore), glass-like pieces of material which are due to the magnesia and other bases present uniting with the silica, etc., to form a slag and underburnt clinker.

3. The production of magnesia flour by grinding the sorted clinker in ball mills or pendulum mills ("dry grinding"), or in edge-runner mills with water ("wet grinding"). This latter is to be preferred when the clinker contains much lime. If the clinker is particularly impure wet grinding will give more satisfactory results than dry grinding, as it enables the various constituents of the clinker to become more thoroughly mixed, and facilitates the combination of any free lime with any free silica which may be present.

4. It is necessary, when wet grinding is employed, to ascertain the specific gravity of the clinker before water is added, in order that the proper allowance may be made for the contraction the bricks will undergo on firing. By judiciously mixing various grades of clinker the contraction of the bricks may be kept within very narrow limits.

5. Moistening the flour with water (if the flour has been produced by dry grinding) is the next step. The proportion of water used varies somewhat, but is commonly about 5 per cent. In some cases dextrin is added to the water, in order to bind the flour better in the press; in others fluxing materials are added, but this is a matter which, naturally, varies with the varying compositions of the clinker, and in many cases the clinker contains sufficient cementing materials to render any further addition entirely unnecessary.

6. Mixing of the moist clinker-flour, in order that the water may become evenly distributed, is best carried out by means of a pug mill, though several of the ordinary mixing machines on the market will work quite satisfactorily for this purpose.

7. The pressing of magnesia bricks is preferably carried out in a hydraulic machine, as great pressure is needed to produce bricks which will bear handling. Even with the greatest pressures yet attempted the bricks are exceedingly tender, and a difficulty is often experienced in removing them from the press.

The pressure required varies with the composition of the clinker of which the bricks are made; if it is easily fusible, with a specific gravity of about 2.2, and containing grains of all sizes up to 1-16th of an inch in diameter, a pressure of 250 atmospheres per square inch will suffice, but for a more refractory and finer flour a pressure of 400-500 atmospheres will be necessary.

Machines which can exert such enormous pressures must

be extremely well built, or they will not work accurately after a few months' use. It has been found that those which exert pressure from both above and below are preferable to those giving a pressure in one direction only.

8. The causes of defective bricks are similar to those of Dinas brick and other manufacturers where it is sought to produce a solid article by compressing a powder in a mould. Air may be contained in the brick, and render it fragile before firing and blistered after, if the two parts of the press which form the mould do not fit each other properly. If the edges of the mould are defective, the pressure will be, to a large extent, ineffectively applied, and the bricks will not be sufficiently firm, whilst lamination occurs when the air is imprisoned in the die.

As already stated, the contraction of magnesia stone on firing is very great, and, consequently, if the clinker has been imperfectly fired before it is ground and pressed into bricks, the second firing will be fraught with considerable difficulty, and probably with much loss, as the bricks will lose their shape, and may fall in the kiln. Even with carefully burnt clinker it is necessary to guard against variations in the contraction which it may undergo during the second firing, and on this account the sorting of the clinker must be carefully carried out, and carefully chosen mixtures of normal, underfired and overfired clinker fed to the grinding mills. One way of testing the contraction is by determining the specific gravity of the clinker, when it will be found that the underfired material is relatively much lighter than the true clinker, whilst the overfired glass-like masses frequently obtained are of still greater specific gravity.

The actual contraction of the pressed bricks in the kiln should never exceed 15 per cent. of their volume (or 5 per cent. of their length), and a somewhat lesser contraction is in all cases desirable. It is by no means easy to keep the contraction within the desired limits as the influence of the varying size of the grains of clinker, variations in the pressure applied in formation, and variations in the temperature and heating of the kiln all exert an influence on the density of the bricks.

9. Drying the bricks before passing them to the kiln is usually necessary—not so much because of their liability to spoil if set direct from the press, as because the utilization of the heat from waste steam, etc., enables them to be dried more economically in this way. Some bricks are found to increase the hardness when they have been dried slowly, but the number of cases in which this phenomenon has been observed is not at present very large. It is in the handling of the goods when dry that the value of dextrin becomes apparent, as when this material is added with the water used to moisten the clinker flour the increased ease with which the bricks may be handled is very noticeable.

10. Setting and burning of the bricks is most conveniently carried out in a Dinas brick kiln, the magnesia bricks being fired either alone or on the top of Dinas bricks. Care must, however, be taken that the magnesia bricks do not come in contact at all with the walls of the kiln. According to one authority, fire-clay works which also produce Dinas

bricks are in the best possible position for producing magnesia bricks at the lowest cost and with the greatest certainty of success, because their customers are the most likely to appreciate the value of magnesia bricks.

A difficulty in filling the kiln entirely with magnesia bricks lies in the special sole of magnesia clinker that must be laid in order to prevent the lowest layers of bricks from being spoiled. There is also a greater risk of bricks falling owing to their being unable to withstand the pressure of the bricks above them, and so spoiling the draught of the kiln, and producing a larger proportion of underfired bricks than is the case with clay goods.

Attempts to use a continuous kiln, some chambers of which are employed for burning the magnesia stone to clinker and the others for burning the pressed bricks, have not proved satisfactory in practice for various reasons, which it is not necessary to enter into here.

To prevent the bricks from adhering to each other after firing they may be dusted over with powdered pikrosmin (which is obtained as a by-product in the manufacture of the magnesia clinker), which may afterwards be removed with a steel brush. The layer need not be more than 1-50 in. in thickness, as it is only used to prevent direct contact of the bricks with each other.

The firing of the bricks is carried out at a temperature varying somewhat with the composition of the clinker, but usually lying between Seger cones 18 and 24. The cones must be set in a special base of either Dinas mixture or magnesia, as the use of clay is not permissible. Although the use of Seger cones alone is capable, in the hands of a competent burner, of giving satisfactory results, yet the frequent reading of the temperature by means of a Wanner (or, preferably, a Féry) pyrometer lessens the risk of errors in firing being made and escaping the attention of those whom they most nearly concern.

The door gap of the kiln, when magnesia bricks are alone being burnt, is best made of clinker and broken magnesia bricks, without mortar, but smeared over with a mixture of chalk and linseed oil to render it air tight where necessary. When fired on the top of Dinas bricks the door can be of the ordinary materials.

The firing is conducted precisely as for clay goods, except that less care is needed at the commencement, because magnesia bricks which have been dried at 30 deg. Cent. can withstand the sudden application of 400 deg. Cent. without inconvenience. Magnesia bricks need somewhat careful cooling and storage, but this part of the manufacture presents no particular difficulties.

It will thus be seen that the manufacture of magnesia bricks is a combination of methods employed in the production of Portland cement, Dinas bricks, and ordinary clayware. It requires considerable care and no small amount of skill, and is not entirely free from danger to the workmen, particularly in the fine grinding and the pressing into shape.

For those who can obtain the raw material at a reasonable price, and who are already engaged in the manufacture of fire-bricks, the production of magnesia bricks offers a field worth considering, as the selling price of these goods is considerably higher than that of the ordinary refractory brick, whilst the cost of manufacture need not be excessive.

—British Clayworker.

WASTE SAVERS.

Every up-to-date brick maker knows now that a Waste Heat Dryer will make and save money, but few are convinced that their boiler plant could be run more economically by using mechanical draft. None would save less than 10 per cent in their coal bill and very often it would be cut in two.

Here are some points why mechanical draft is advantageous:

1. Increased steaming capacity (up to 100%) or decreased size of boiler plant for given output.
2. Decreased fuel consumption per developed horsepower.
3. Inferior fuel may be used.
4. Independence of weather and climate.
5. Omission of chimney.
6. Mechanical stokers may be used.
7. Smoke prevention.
8. Utilization of Waste Heat in gases.
9. Economy in space.
10. Economy in first cost.

There are two kinds of mechanical draft: Forced and Induced. Forced draft furnished the necessary oxygen to burn coal by blowing say about 200 cubic feet of air for every pound of coal burned, in the closed ash pit.

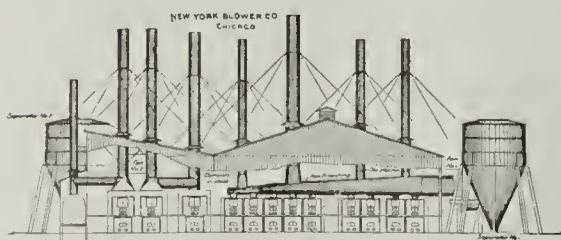
Induced draft sucks smoke and gasses from the boiler. The fan handles the 200 cubic feet of air necessary for burning every pound of coal, expanded to about 400 cubic feet by the rise in temperature and also the gases generated by combustion.

A forced draft apparatus is proportionately smaller and therefore cheaper, but forced draft will not always work successfully, while induced draft will. The decision which to use ought to be made by a competent engineer. By applying to the New York Blower Co., 25th Place and Stewart Avenue, Chicago, full information may be had.

In the following we give views of some of the fans used in mechanical draft and sketches of a few typical applications:



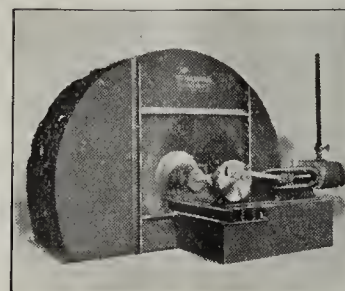
Peerless blower for forced draft.



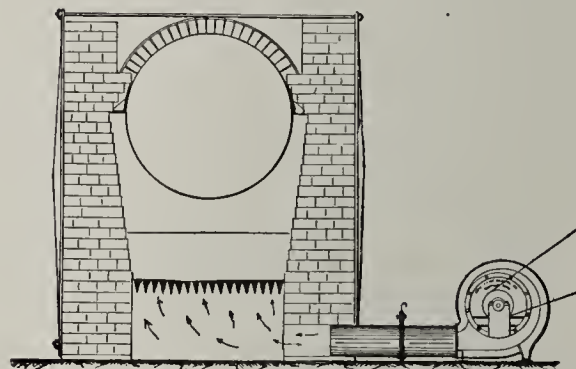
Induced draft apparatus with cinder separator.



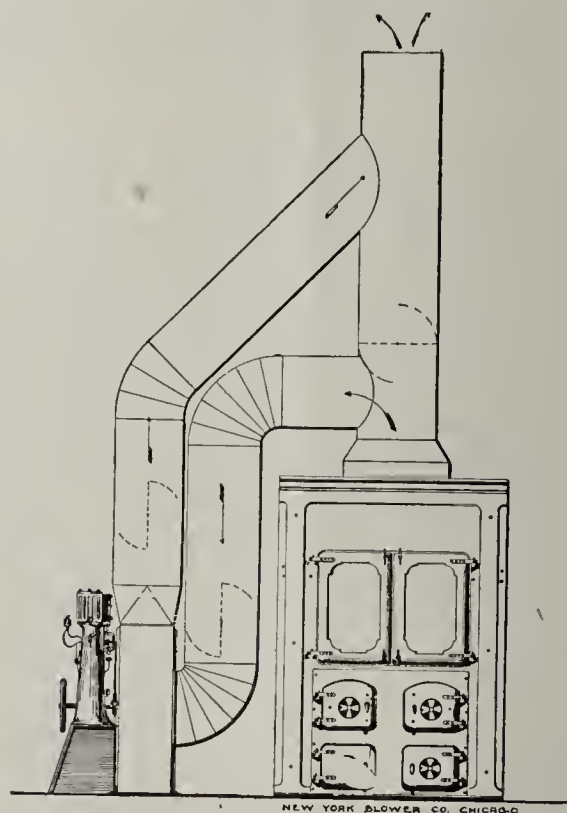
Engine driven steel plate fan for forced draft.



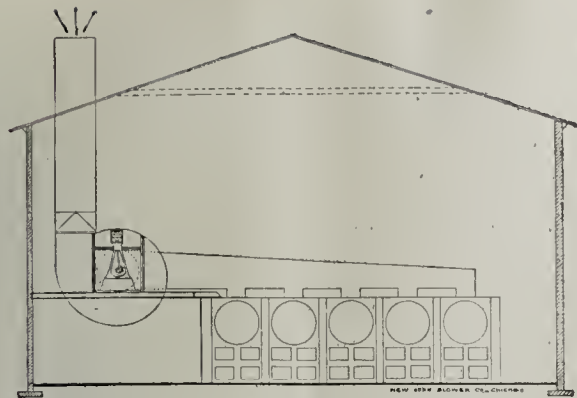
Engine driven, three quarter housing for induced draft with water cooled bearing, supported by I beam grillage.



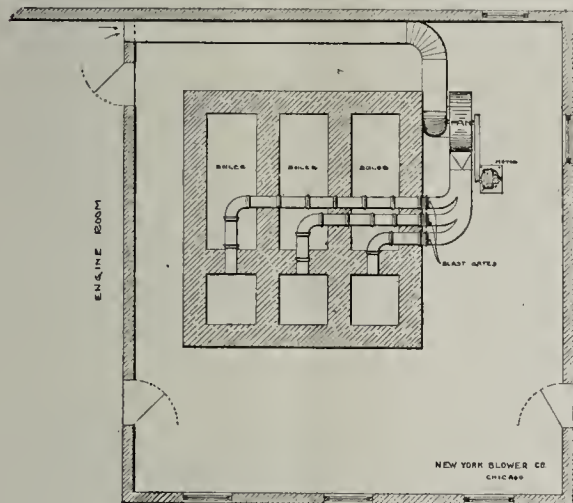
Forced draft by belt driven Peerless Blower.



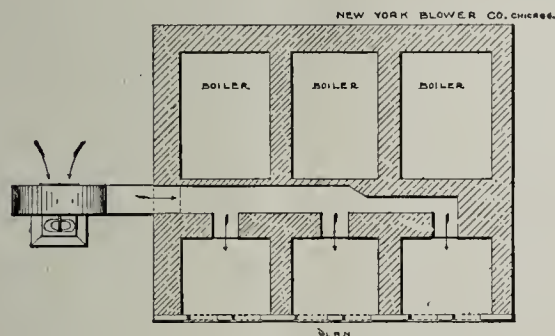
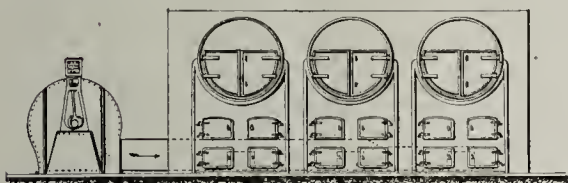
Induced draft with engine driven fan.



Induced draft with engine driven fan for battery of boilers with short chimney.



Forced draft fan belted to motor. Same fan ventilates engine room.



Forced draft by engine driven fan.

WESTERN STONEWARE CO., WITH CAPITAL OF \$1,750,000, FILE INCORPORATION PAPERS.

The articles of incorporation of the Western Stoneware company, Monmouth, Ill., comprising the eight potteries known as the Monmouth Pottery company, the Weir Pottery company, the Macomb Stoneware company and the two plants of the Macomb Pottery company, the Culbertson Pottery, Whitehall, the Clinton (Mo.) pottery and the Fort Dodge (Ia.) Stoneware Co. were filed in Springfield, this state. The capitalization is fixed at \$1,750,000.

The officers of the above incorporation are:
President—W. D. Brereton of Monmouth.
Vice President—P. E. Elting of Macomb.
Secretary—A. D. Philpot of Chicago.
Treasurer—George E. Patton of Monmouth.
Superintendent—Charles Kettron of Macomb.
Ass't Supt —E. E. Spencer of Monmouth.

The Board of Directors of the Western Stoneware company are: A. N. Eastman and A. D. Philpot of Chicago; W. D. Brereton, J. Ross Hanna, of Monmouth; P. E. Elting of Macomb, P. A. Falkener of Kansas City, David Culbertson of Whitehall, Charles Kettron of Macomb.

The prospectus of the organization showed a capacity of the seven plants at something over 16,000,000 gallons yearly. That was the amount of the capacity at that time, but within a year it is expected to increase this capacity to at least 23,000,000, divided about as follows:

Monmouth Pottery Co.....	6,000,000
Weir Pottery Co.....	3,000,000
Macomb Stoneware Co.....	3,500,000
Culbertson Pottery Co.....	2,000,000
Ft. Dodge Stoneware Co.....	1,000,000
Clinton Stoneware Co.....	1,500,000

23,000,000

It is expected to increase the capacity of the plants this year so that they will manufacture that much ware and in a short time to increase the amount to 26,000,000.

The charter under which the company is formed is a broad one, and the policy of the new incorporation is to gradually extend its field to the handling of all kinds of clay ware. The annual output of the new company will be 5,000 cars per annum, all the companies to be run at full capacity all the time. Prominent capitalists are behind the deal and the present is but the start of what the company will eventually be.

As stated, the headquarters of the incorporation will be in Monmouth, and the local offices will be located here. An addition is being built to the office of the Monmouth Pottery company and increased office force will be installed at once. The inventory of the various plants is now under way, the Weir and Monmouth potteries being shut down during this process.

The original articles of the company were filed in Maine, the articles which were filed in Springfield being the sub-incorporation papers. The business and extent of the company's plants will be increased as fast as possible.

The entire business of the company will be transacted through the head offices located in this city. Both the local plants will be run to the limit of their capacity. It is probable that new facilities will be added to the local plant at once.

The selection of W. D. Brereton of the Monmouth Pottery to head the new company is a fitting tribute to the ability which has characterized his management of the local company. The location of the headquarters of the company means a great deal to the Maple City in an industrial and financial way, and is an added boom to "a better and greater Monmouth."

A NEW THEORY OF PLASTICITY.

Mr. Lorenz Wolff has recently published a new theory as to the cause of plasticity of clay, which may prove to be a valuable stepping-stone to future practice in that, so far as the theory is correct, it will enable clayworkers to experiment on sounder lines than they have done in the past, says *The British Clayworker*.

There has been a general impression for some years past that the plasticity of clay was related in some way or other to the combined water of the clay, because when any clay is heated sufficiently to drive off its combined water, it at once loses its plasticity, and no means have yet been discovered for restoring this plasticity to the clay, with the possible exception of some recent experiments of Dr. Mellor's, in which it was found possible, by heating clay and water under pressure in sealed tubes, to very slightly increase the plasticity of clay and similar materials. These experiments have, however, been made on so small a scale that they will have to be repeated frequently on a commercial scale before the increase in plasticity can be considered as assured.

Meanwhile we turn to Mr. Wolf's paper, in which we find plasticity defined as "the property of a body which enables it to absorb water in its pores in such a manner that the properly moistened body yields to mechanical pressure; but when the pressure has been removed, the shape of the body remains as though the pressure were still acting upon it."

The more evenly distributed the water is through the solid mass, and the smaller the distance by which the particles are separated from each other, the more readily will they move over each other, and the greater will be the plasticity. The smallest conceivable particle of any compound is known as a molecule; consequently, if in any case it were possible to separate each solid molecule from the next by a definite quantity of water, an ideal condition of plasticity would be reached.

It is not merely sufficient that each molecule of clay should be separated from the rest by a quantity of water; the *amount* of water is of great importance. If, for instance, the water is insufficient to properly separate the particles, they will attract each other strongly, and will not yield properly to minute pressures, whilst if too much water is present, the mass will not have sufficient cohesive power, and will fall to pieces. Clay with exactly the correct amount of water is found but seldom, as much time is required for the water to penetrate between each molecule of clay, and the action of pressure (including gravitation) tends to compress the lower layers of a clay bed, and so renders it almost impossible for the perfectly even distribution of the water in just the right amount throughout the mass. This can easily be seen by soaking two different classes of clay for the same length of time in water, when it will be found that the denser (say a shale) will absorb far less water than the more open clay (surface clay), and will take much longer to become equally plastic. In some cases the amount of time required for a clay to become plastic is so great

that it is beyond all our powers of endurance, and probably takes many, many years, even under the best conditions.

When a solid substance becomes plastic on addition of a liquid, it is probably because the smallest particles (molecules) are then able to move readily over each other, and this motion takes place more readily and more evenly in all directions the nearer the shape of the particles approaches to that of a sphere; for in a sphere the distribution of force and the effect of external forces is equally great on all sides, and spherical bodies possess an attractive power equal in all directions to the fluid particles of a mixture of solid and liquid.

As bodies which possess a greater force in one direction than another (such as crystals) cannot move so easily over each other when in a moist state, it follows that to attain the maximum plasticity the particles must be spherical and not crystalline in form. This is confirmed by the recently published experiments of the U. S. A. Department of Agriculture, in which the more plastic clays were found, on microscopical examination, to contain the larger proportion of non-crystalline ("amorphous") matter, and of a size so minute that it taxed the strongest microscopes to definitely show their shape.

In studying the plasticity of clay, it must be remembered that under this simple word "clay" are gathered together numerous compounds of widely differing characteristics and properties and of widely diverging composition. Clay is, in fact, not a substance but a mixture, and it contains, in addition to the pure "clay substance" (Al_2O_3 , 2 SiO_2 , 2 H_2O), a varying proportion of sand, quartz, felspar, mica and other silicates, many of which do not, under any circumstances known to us, possess any plasticity.

It may be stated in general terms that a clay varies in plasticity according to the proportion of pure "clay substance" which it contains; but this statement is only true to a limited extent, because the plasticity of a clay is also governed by a variety of physical characteristics which cannot be predicted from the chemical composition of the mass. For instance, it is, above all, important that the clay shall allow the water necessary to its plasticity to penetrate evenly throughout its mass, so that the density of the clay is of great effect in determining the plasticity of the clay. The effect of differences in density for clays of similar composition can usually be equalized by altering the time of soaking the clay in water, or by exposing it to the weather.

The condition of the size of the clay particles is of great importance. Pure clay substance only crystallizes from certain forms of clay-producing minerals such as felspar, and usually in the form of monocline plates or tables. Such clays, on account of their not being spherical in the form of their smallest particles, cannot be so plastic as the so-called "amorphous" clays, and, consequently, clays which are found near to the place of their formation (as the kaolins) are invariably less plastic than others. Long exposure to weather, water, or any other simple agency cannot increase their plasticity to any notable extent, as an increase in plasticity can only be obtained by a partial destruction of the crystalline form. If a clay can be so finely ground that the

essential crystalline form has less effect than the spherical shape of the particles can make up for (as when a kaolin clay has been transported by natural agencies for a considerable distance from its source, and has become ground and "pebbled" in the process) a plastic clay rich in clay substance may be produced; but the grinding required is of such a nature that attempts to produce it in ball and other mills are not likely to be successful owing to the enormous length of time required making the process of reduction prohibitively costly. It is on this account that clays containing a relatively small amount of clay substance are actually more plastic than the purer kaolins. This also explains why clays which have their clay substance in an extremely finely divided and spherical state, and which dry to a hard, horny mass, may, nevertheless, be classed as plastic clays, as distinguished from the kaolins which dry to a loose powder.

On sufficient exposure to water many clays of a dense nature become highly plastic, if they contain a moderately high proportion of clay substance. In such cases, however, the water must be able to distribute itself evenly throughout the clay substance, in spite of the narrow spaces between the molecules. In other words, the resistance exerted by the clay to any separation of its particles cannot be much greater than the power possessed by the water or by the opposite attractive force which exists between the molecules of a solid body and water.

This last-mentioned attractive force cannot, on the other hand, be much greater than the attraction of two molecules for each other, or the substance would immediately fall to powder in water.

It therefore follows that the attractive powers of a plastic substance and of water for each other must be approximately equal to the molecular attraction of a solid body.

To calculate the attraction of the particles of two bodies, the weight and mass of each and the distance between their molecules must be known, and, for the purpose of his argument, Mr. Wolf assumes that the molecules of all substances are small spherical bodies—an assumption which is probably correct, and which greatly simplifies the calculations which follow.

As the molecular weights and densities of the commoner compounds are known, the volume of one or more molecules can be readily calculated, and the molecular properties of "clay substance" are based on the assumption that it follows the conditions which would obtain if it were a true compound of the formula $\text{Al}_2\text{O}_3, 2 \text{SiO}_2, 2 \text{H}_2\text{O}$.

According to Newton's Law of Attraction, the attraction of two bodies is proportional to their mass and inversely proportional to the square of their distance. Hence, the attraction of two particles (molecules) of solid matter for each other may be calculated, and are shown in col. M. in the following table, whilst the attraction between one molecule of the solid and one of water is shown in col. A.

A similar calculation shows that, whilst the insertion of one molecule of water between two molecules of clay substance reduces the value of M. from 14.8 to 6.2, the insertion of eight molecules of water reduces the value of M. to 3.37, or rather less than the corresponding value for two

molecules of water (3.4); so that with this proportion of water (equal to about 40 per cent. by weight), the mass has no longer any power of cohesion, but falls to pieces. In actual practice a somewhat larger proportion of water is required, as some is used up in overcoming the resistance of the impurities of the clay.

A CONFIRMATION OF THIS THEORY.

Proof of the fact that most of the substances commonly occurring in clay can be made plastic, if sufficiently finely divided, and provided that they have a sufficiently large M:A. ratio, is obtained by precipitating the desired compound from a dilute solution in a sufficiently fine state, when it will be found that they may be mixed with pure clay substance to the extent of 25 per cent. or more, according to the M:A. ratio of the added material. Thus chalk, which has a low M:A. ratio (100:73), has a much more serious effect on the plasticity of clay substance, to which it has been added than the same proportion of magnesium carbonate or magnesium hydrate, both of which have higher ratios.

Another curious effect is that of the presence of water in the molecule of the added substance. This additional (combined) water greatly increases the M:A. ratio; thus silica has a ratio of 100:70, but with one (combined) molecule of water the ratio is increased to 100:81. Iron oxide, hydroxide, and calcium sulphate—both anhydrous and hydrated—behave similarly.

It is, therefore, evident that the M:A. ratio of substances occurring in clay is of the greatest importance in determining the maximum plasticity of which the clay is capable, or in determining what other minerals may be added without affecting the plasticity of the clay.

It must, however, be distinctly understood that to obtain the maximum plasticity the substances must be divided to almost molecular fineness—a condition which cannot be obtained by ordinary grinding, no matter how thoroughly this operation is carried out, by ordinary mills.

The intensely finely ground particles of plastic clay are partly due to the extremely lengthy rubbing it has undergone in its transport from the place of its original formation to that from which it is dug. No clayworker could afford either the time or expense of so fine a grinding, but if it were possible to greatly decrease the time required for this process, it seems possible that all clays might be made equally plastic.

The author of this theory claims that, although the plasticity of clay may be in part due to minor characteristics which have been pointed out by previous observers, yet the chief source of plasticity is to be found in the fine state of the particles and in the relation which exists between the attraction of the particles for each other and for the water between them.

The Lindenwald Brick Co., Hamilton, Ohio, has begun operations on land located on Mount Pleasant Pike and will soon be ready to furnish brick. The company is composed of George Pater, Henry Pater and Frank X. Duerr.

"DRAIN TILE."*

By J. A. WILSON, Dows, Ia.

This subject, "Drain Tile," is of great and vital importance to all who are interested in the development and improvement of state and country. It is a recognized fact today that we must have some means of underground drainage to bring our soil up to its fullest state of productivity. Therefore the question, "How shall this be accomplished?"

We will discuss a few phases of this subject that appeal to us as being worthy of our consideration. Although it has been reserved to the present time to see land drainage reduced to a system, or at least very great improvements made in methods, based on scientific principles, it is by no means a modern discovery.

The Romans were careful to keep their arable lands dry by a means of open trenches, and there are some grounds for surmising that they even used covered drains for the same purpose. It is at least several centuries since the British Husbandmen made use of covered drains or channels of various kinds for the drying of their land. It is two centuries since Captain Walter Blythe wrote on this subject and said: "Superfluous and venomous water, which lyeth in the earth and much, occasioneth bogginess, miriness, rushes, flagg and other filth, is indeed the chief cause of barrenness in any land of this nature. Draining is an excellent and chiefest means for their reducement; and for the depth of such drains I cannot possibly bound, for I have not the time nor opportunity to take in all the circumstances. And for thy drainage trench, it must be so deep that it goes to the bottom of the cold spewing water that feeds the flagg and rush; yea, suppose that this corruption that feeds and nourishes the flagg and rush should lie a yard or four feet deep, to the bottom of it thou must go if ever thou wouldst drain it to purpose."

By this we see that at that time Blythe understood and advocated principles of drainage that we today believe to be correct. Also Captain Blythe had in mind the advantages and we may say the necessity of keeping the draining trenches as near to grade and in a straight line as practical.

A little more than a century ago Elkington discovered and promulgated a plan of drainage by a means of covered drains or trenches partly filled with stones, etc., which was more or less successful, and his plan was given to the public in a quarto volume by Mr. John Johnston of Edinburgh. During the thirty or more years subsequent to the publication of this volume, most of the drainage that took place was on this system, and an immense capital was expended with ever varying results.

About the year 1823 the late James Smith of Deanston, having discovered anew the principles of draining so long before advocated by Blythe, proceeded to exemplify them in his own practice and to expound them to the public in a way that speedily revolutionized the art of drainage and marked an era in our agricultural progress.

Instead of persisting in fruitless attempts to drain large

areas by a few extensive cuts, he insisted on the necessity of providing every field that needed drainage at all with a complete system of parallel channels or drains, running with the greatest slope of the ground and the distance apart of these channels ranging from 10 to 40 feet. The depth which he prescribed for his parallel drains was 30 inches and these to be filled 12 inches with stones small enough to pass through a three inch ring—in short, a new edition of Blythe's drain. A main receiving drain was to be carried along the lowest part of the ground with sub-mains in every subordinate hollow that the ground presented.

These receiving drains were to be of sufficient size to carry the greatest amount of water at any time requiring to be carried from the area from which they supplied the outlet.

Mr. Smith appropriately named this system according to its effects, "Thorough Draining." The great labor and cost of these drains soon led to the substitution of tiles and soles, sometimes called Horse Shoe tiles, of burned earthenware. The limited supply and high price of these tiles for a time impeded the progress of the new system of drainage; but the invention of tile making machinery by the Marquis of Tweeddale and others, removed this impediment and gave a mighty stimulus to this fundamental agricultural improvement. The substitution of the cylindrical pipes for the old horse shoe tiles has further lowered the cost and greatly increased the efficiency and permanency of drainage works.

The writer has helped to rive out timbers and construct drains from them, also from poles and stone much as described above, and we as tile manufacturers are all acquainted with the passing from the old horse shoe type of tiles to the octagon type and from that to our present type of drain tile. Also we have marked the very great improvement made in the machinery for the production of all articles of earthenware—the passing from the old hand and horse power machinery to the present up-to-date machinery now running in the extensive factories located throughout the entire country, until the manufacture of drain tile has become a very great industry.

The farmers are well up to the spirit of the times, and we believe that as a class they are among the best read people to be found in America. The farmer is found to be a ready buyer when convinced that advantages are sure to follow his investment. We may say, this is a sort of "show me" age, in which demonstration is the rule and not the exception. The farmer as a practical man fully appreciates his inefficiency in this matter of drainage, therefore if the tile manufacturer will explain the principles of drainage and point him to the correct method of laying the tiles, he will greatly increase his business, for it will increase the number of tiles used when a proper system is installed. Also by increasing the efficiency of the drainage you may have helped to engineer, you not only cause the farmer to reap greater benefits than ever before, but his confidence in your business is firmly established. To our mind there is no better advertiser than a thoroughly

*Read at the Iowa Brick & Tile Association meeting.

satisfied customer and none are blind to the necessity of good advertising. There is no better way to put the merits of a manufactured article before the public than by judicious advertising. With drain tile as with other products advertising alone is insufficient, but needs to be backed up by experiments and tests, and there are few more practical tests than a well drained farm. There is room for improvement in all manufactured articles and some room for improvement in drain tiles and drainage, but tile drainage as it is today has attained a very high standard of perfection. Let us note a few of the benefits to be derived from a thorough system of drainage. In swamp land this system is the only one that is safe, as it does not permit the water to run off too fast, thus giving the soil ample time to adjust itself to the absence of water, to which it has not been accustomed.

In loamy soil tile drainage has a very beneficial effect. The land is thoroughly ventilated, as loam is not so tenacious as clay, thus giving all decayable matters a chance to decay and form humus. The ventilation also keeps the ground warm and aids in keeping it sufficiently dry. On sloping ground the water from a heavy rain sinks to the tiles and is carried off as it falls, thus leaving the ground damp and warm and in proper condition to promote plant growth. If there were no tiles there the pores of the ground would become saturated until they could take no more water, and slope would be cut into gullies and the earth washed away from the roots of the plants, greatly hindering their growth and making the ground cold and backward, for the pores are full of water that has chilled and much of it must rise to the surface and be evaporated.

The depth to which tiles should be laid is a matter agreed upon by few. In past years drain tile was generally laid at a depth of from 2 to 3 feet, but today no one thinks of laying tile less than 3 to 3½ feet and 4 feet is considered the standard. It has been proved that a 4 foot drain will do all that a three foot one will do, and in most cases a great deal more. The tile drains an area below the tiles and takes the water from places that a shallower drain would have no influence upon whatever.

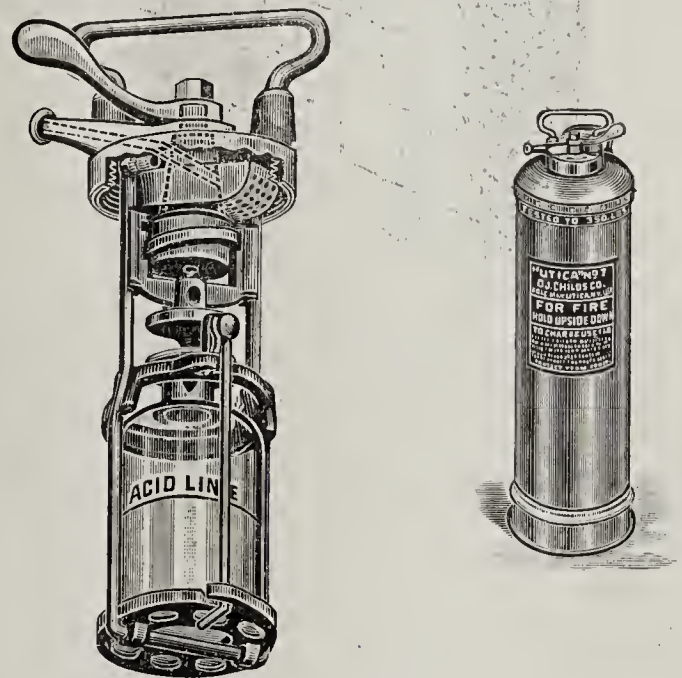
We do not wish to take space to mention a great many of the benefits of drain tile in time of drought, yet it will be found that the tiles will pay for themselves in a time of considerable drought, not so much by what they do, as by what they prevent being done. There can be no fixed standard of cost of this system of drainage, as conditions vary so greatly. In considering the cost of a system of drainage, one should remember that it is not work that is done for a day, but for generations, if properly done, hence the very great importance of having the work done very carefully and by competent men.

The United States government stations give many interesting and instructive statistics of experiments and tests along these lines of drainage and places the increase in value of properly drained land at from 20 to 50 per cent.

The plant of the Union (Ia.) Brick and Tile Co., owned by B. O. Witter, which was destroyed by fire a few months ago is to be rebuilt at once.

NEW CHEMICAL FIRE EXTINGUISHER FOR USE ON STEAM AND ELECTRIC CARS, BOATS, ETC.

The O. J. Childs Company, Utica, N. Y., U. S. A., large manufacturers of Hand Chemical Fire Extinguishers for all purposes, have perfected a special machine which they are just putting on the market in two sizes: "Utica" No. 7, for steam and electric cars, pleasure boats and automobiles. "Utica" No. 8, for steamships and large vessels. These machines are built without hose and have a stop cock outlet in cap, and the lever that opens and closes the stop cock, which controls the contents of the machine, also operates the stopple which corks the bottle. In other words when the stop cock is shut off the stopple is held firmly in the bottle, and when the stop cock is open the stopple is lifted away from the bottle and allows the chemical to mix when the extinguisher is inverted.



The accompanying cuts show the machine complete, and also the cap with stop cock outlet, and hanger and bottle attached. These extinguishers are approved by the U. S. Government under Department of Commerce and Labor for Steamboat Inspection Service, rules January 1906. These machines are built of the best Lake Superior cold rolled copper, and the brass parts are of the best bronze brass valve metal, and the interior of the machines are lead lined throughout.

The O. J. Childs Company can be complimented on their success in perfecting this machine. They already report having secured some very nice orders from two of the largest electric trolley roads in central New York, and have also equipped a number of pleasure vessels in New York City.

CLAY IN IOWA AND MINNESOTA.

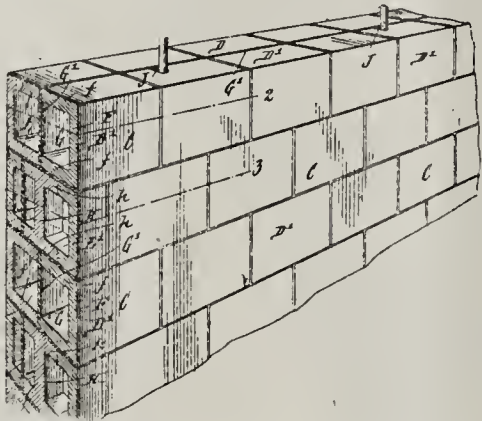
At points in Iowa and Minnesota on The North-Western Line, there are locations where deposits of clay and pottery material are found, and only require a test to prove their suitability for industries in this line of manufacture. Reference to these will be given upon request to the Industrial Department, Chicago & North-Western Railway, Chicago.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

817,478. Building Construction. George F. Fisher, North Tonawanda, N. Y. Filed Jan. 30, 1905. Serial No. 243,316.

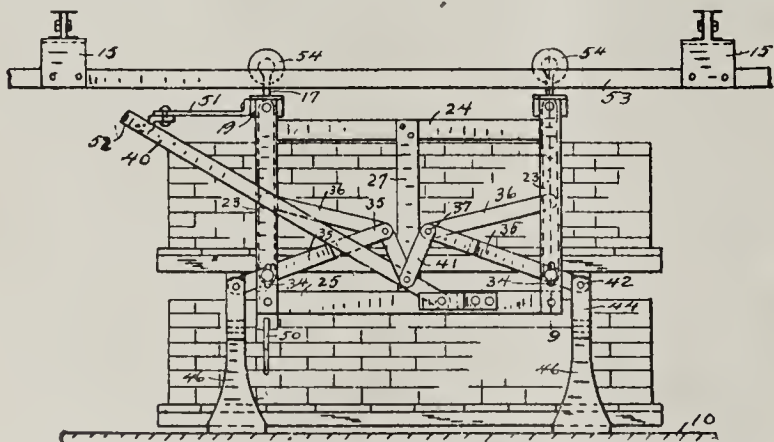
Claim. A hollow building-block consisting of a plurality of sections, each block comprising facing sections having depressions on their inner sides, and an intermediate section having depressions on both sides, the depressions of the intermediate section being in opposing relation to the depressions in the facing sections, thereby forming an air-space between the intermediate section and each facing section.



In a building, a wall formed of hollow separable blocks set in courses, every alternate course being constructed of blocks formed in two sections having opposing depressions and a sheet of paper between said sections, and the intermediate courses being constructed of blocks comprising two facing sections having depressions on their inner sides, an intermediate section having depressions on both sides, and a sheet of paper between the intermediate section and one of said facing sections.

817,643. Drier. John R. Hussey, Indianapolis, Ind. Filed May 17, 1905. Serial No. 260,769.

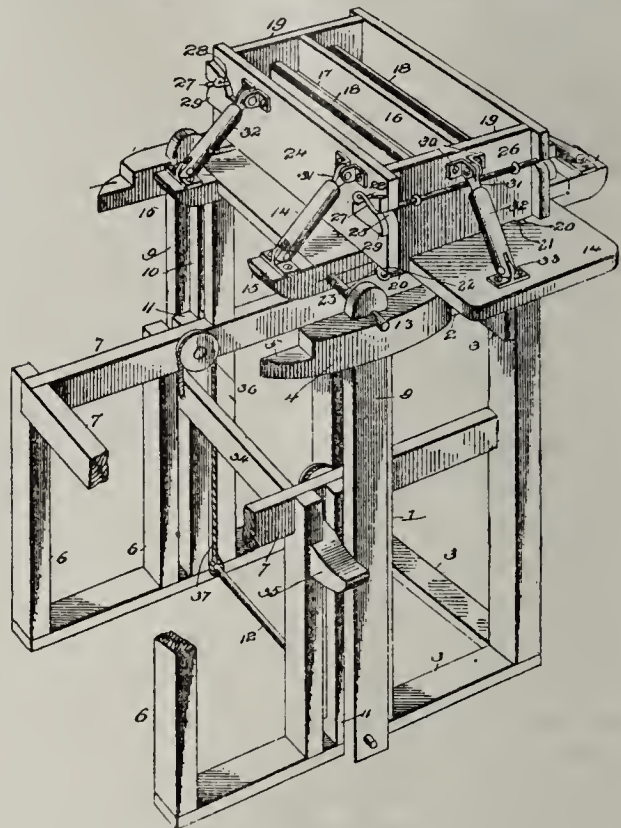
Claim. The combination of an overhead traveling carrier consisting of two cross-bars at the top, a downwardly-extending bar on each side of said cross-bars and a longitudinally-extending side bar at the lower end of said vertical bars being each provided with a vertical slot, a tray, a hand-lever



pivoted to each side bar at each side of said carrier, a tray-fulcrumed in each of said vertical slots so the fulcrum thereof will be vertically movable, said tray-carrying levers extending in opposite directions, means on the opposite ends of said tray-carrying levers for engaging or disengaging the tray, vertically-extending toggle-levers pivoted at their upper ends to some part of the carrier and at their lower ends to said tray-carrying levers near the tray-carrying ends, connecting-bars pivoted to the middle of the toggle-

levers and to the inner ends of the tray-carrying levers, and vertically-extending connecting-bars pivoted at one end to the inner ends of said toggle-connecting bars and said load-carrying levers and at the other end pivoted to said hand-lever.

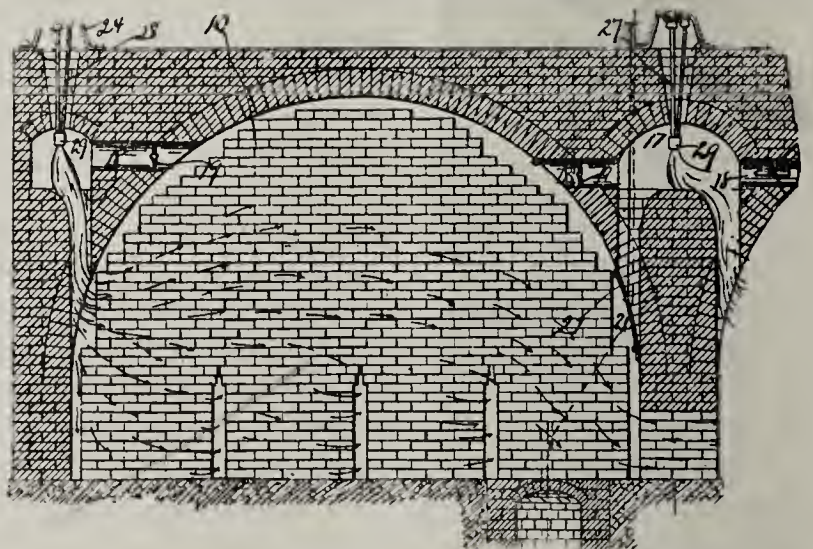
817,489. Molding-Machine. Orion D. W. Inman, Beloit, Wis. Filed May 1, 1905. Serial No. 258,367.



Claim. A machine of the character described the combination with the walls of an invertible mold and a core; of means for moving the core and laterally moving the walls at one operation, successively, while the mold is inverted.

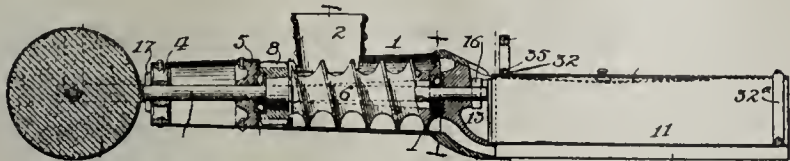
In a machine of the character described the combination with a table; of an invertible mold comprising laterally-movable walls, means for detachably securing the walls together and telescopic connections between the walls and table and constituting supports for the mold when inverted and raised.

818,129. Oil-Burning Brick-Kiln. Richard South, Los Angeles, Cal., assignor of one-half to Morris Marks, Los Angeles, Cal. Filed Aug. 10, 1905. Serial No. 273,575.



Claim. The combination with a plurality of kilns, of partitions separating the kilns, combustion-spaces in said partitions, escape-flues leading from the combustion-space of each partition to the kilns on both sides of said partition, and a lower flue arranged in the partition for placing adjacent kilns in communication with each other.

817,383. Apparatus for Molding Plastics. George T. McIntyre, Riverside, Cal. Filed Feb. 17, 1905.



Claim. A machine for molding plastics comprising a casing, having a charging-opening at one end and a discharge-opening at the other end, said casing flaring from the charging to the discharging end, a force-feed device within said casing, and a mold connected to the discharging end of the casing.

817,988. Manufacture of Brick. Gust A. Riddle, Pittsburg, Pa., assignor of two-thirds to J. W. Fritts and C. J. Mathewson, Pittsburg, Pa. Filed Dec. 17, 1904.

Claim. The herein described composition of matter for the manufacture of brick, consisting of ground or pulverized ganister stone, silicate of soda, water and glycerin, in or about the proportions stated.

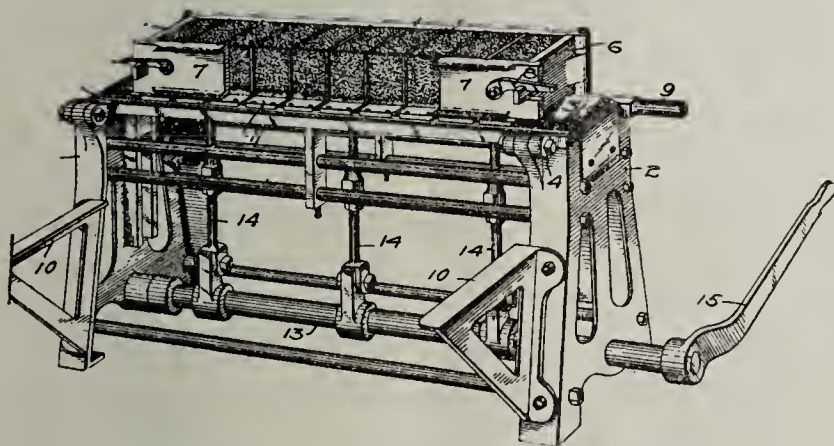
The herein-described composition of matter for the manufacture of brick, consisting of ground or pulverized ganister stone nine gallons, silicate of soda one gallon, water one gallon and glycerin twelve drops to each gallon of silicate of soda, substantially as set forth.

818,287. Process of Treating Clay. Eugene S. Powers, Merchantville, N. J. Filed July 10, 1905.

Claim. The herein-described process of making plastic products, consisting in incorporating with clay a liquid solution of silica, or similar inorganic substance, molding same, and thereafter causing the crystallization of said silica on the surface of the composition.

The process of making plastic products, consisting in mixing clay and sand, adding and mixing liquid solution of silica, molding such composition, then causing the formation of an oxid on the exposed surface thereof, and thereafter heating same whereby the oxid forms a crystallized crust, substantially as described.

818,286. Process of Molding Concrete Bricks or Blocks. William Porten, St. Paul, Minn. Filed Sept. 20, 1905.

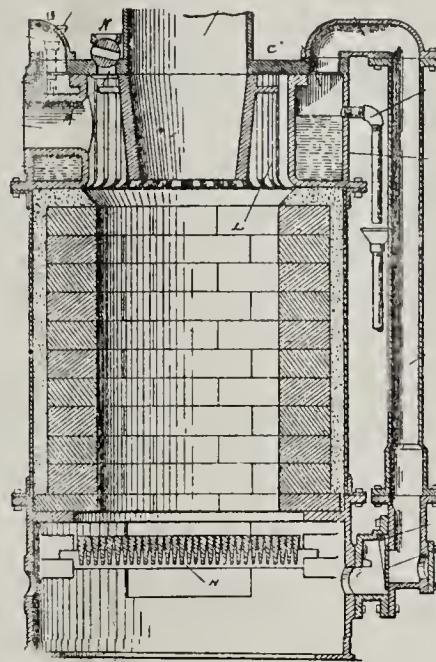


Claim. A process of molding concrete bricks or blocks which consists in placing a thin layer of cement in a mold having a hard smooth floor to form on the block a finished facing impervious to moisture, and then filling up and tamping the mold with a mixture of coarse sand and cement to form a comparatively porous backing, substantially as described.

A process of making a concrete brick or block which consists in placing a thin layer of fine sand and cement mixed in suitable proportions in a mold having a hard smooth floor to form a finished facing on the block, and then filling up and tamping the mold with a mixture of coarser sand and proportionately less cement whereby a softer, more pervious backing will be formed, substantially as described.

817,853. Gas-Producer. Franklin G. Hobart, Beloit, Wis., assignor to Fairbanks, Morse & Company, Chicago, Ill., a Corporation of Illinois. Filed April 19, 1905.

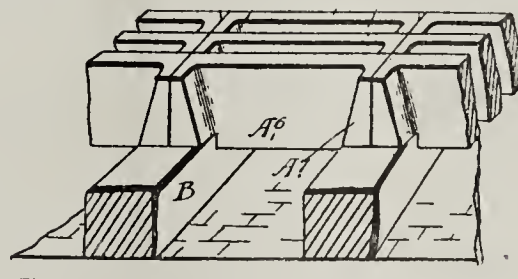
Claim. In a gas-producer, the combination with a magazine, of an annular vaporizer surrounding the lower end of said magazine, and spaced therefrom, and a top for said vaporizer extending inwardly over the said space and connected to said magazine, said top having apertures opening into said vaporizer, and valved poker-holes opening into the space between said magazine and vaporizer, for the purpose described.



In a gas-producer, the combination with a magazine, of an annular vaporizer surrounding the lower end of said magazine and spaced therefrom, ribs on said vaporizer projecting into said space, and a top for said vaporizer bridging said space and connected to said magazine and having apertures opening into said vaporizer, and valved poker-holes opening into the space between said magazine and vaporizer, for the purpose described.

818,308. Floor-Brick for Downdraft-Kilns. Richard Southworth and Joseph E. Holden, Mimico, Canada. Filed Dec. 8, 1905. Serial No. 290,959.

Claim. A floor-brick for kilns having one plain vertical side and plain vertical ends and one recessed side forming end projections, and a depending portion of the length of the bottom of the recess extending beneath the body portion said end projections having upwardly and outwardly inclined opposing faces as and for the purpose specified.



The combination with the beams, of a plurality of bricks having one of the sides plain and the other side recessed, so as to provide projecting ends, which are designed to fit against the plain side of the adjacent brick, and all the bricks being arranged, so that the ends abut each other and the joints over the beam are alined, and the depending portions extend between the beams said projecting ends having upwardly and outwardly inclined opposing faces so that the space formed between two bricks is smaller at the bottom than at the top as and for the purpose specified.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

393 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII.

MAY 31, 1906.

No. 10

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

A chronic borrower is naturally a trifle touchy.

Subscribe for the Clay Record now. It costs only one dollar per year and is pointed.

If anyone sticks a pin in your toy balloon, don't waste any time trying to save the contents.

What a delightful world this would be if every man could select the other fellow's reading matter.

Too many men make strenuous efforts to get a liberal share of something that doesn't belong to them.

The workman who takes a real interest in his work doesn't have to spend much time looking for a good job.

When you encounter a man who tells you the world is growing worse, give him the sorrowful look and pass on.

On account of the illness of the Editor, the last two issues of the Clay Record has been delayed a few days. However, we hope to have the June issue out promptly.

We hear it said, and that often, particularly by those whose line of business it is to promote education and who are harping everlastingly on the string, Educate! Educate!

Educate! that the people are growing wiser; that they know more than their fathers, and similar talk; but we must confess that a superficial analysis of everyday happenings manifestly contradicts these statements. Now we are not alluding to what people know about Latin or Greek, history or art, in this criticism, but to actions and conduct observed in practical matters in everyday business affairs. We fail to see where this generation is profiting from the experience of the past, which it should if it is growing wiser.

Take one thing to make this point. Note the recent astounding revelations of the conduct of men in high finance in the management of great corporations and in connection take note of the stupidity exhibited on the part of the stockholders in these institutions.

Many, many years ago Herbert Spencer remarked that in matters of business, and in matters of business at large, the maxim should be: "Do not suppose things are going right till it is proved they are going wrong, but rather suppose they are going wrong till it is proved they are going right." Let us suppose this generation had cherished this item of knowledge handed down and thereby had grown by as much wiser to the extent of appropriating and applying this principle in the world of affairs could it have been possible the rottenness recently revealed and that known but yet to be brought to the light?

We admit there has been improvement along intellectual lines, but we deny the present generation is wiser than nearby generations in matters of morals pertaining to everyday life in domestic and business affairs, not because it lacks in principles, (admitted in theory) but that these are scorned by it in practice.

After waiting patiently for months the Congress in its good pleasure has passed the Rate Bill which is now in the hands of the President for his signature. The law is not what it should have been or what the people had a right to expect from a body of men who presumably were elected for the purpose of legislating for the interests of the people. However, the American people have become so used to getting "half a loaf" they have accepted it without protest, so far as we have learned, although there are some indications that there is an undercurrent of feeling and sentiment that will, when an opportunity presents itself, break out and the outcome will be that many, if not all, of those against whom this feeling and sentiment are held will be relegated to private life.

In touch as we are with men of all shades of political bias, we have been surprised at the unanimity of a sentiment to rebuke the moss-covered and antiquated appeal that this and that are "unconstitutional" if enacted into law;

this sentiment being unanimous that if the constitution is opposed to the features demanded, then change the constitution; grant our forefathers had wisdom it does not follow they had, or that we believe they had, the wisdom of the ages; that it is not to be conceded they could and did anticipate the conditions of the twentieth century, etc., and provided for them in the constitution.

Politics is not our business, but as citizens interested only in the welfare of the country, we recognize a necessity for many changes, and if we read aright the signs of the times at the next general elections there will be a shaking up and a breaking up of the old lines, the like of which this country never before experienced.

OBITUARY.

Ralph A. Hellier, son of the late Walter S. Hellier, founder of the Bangor (Maine) Brick Co., is dead.

Harry Dietschler, of H. Dietschler's Sons, brick merchants, died at his home, 870 Clinton St., Buffalo, N. Y.

John De Haven, age 55 years, died at his home in Altoona, Pa., of stomach trouble. He was the manager of the Altoona Brick & Tile Co.

Harry C. Ellis, one of the oldest brick makers of Toledo, O., died of tuberculosis at his home. He was 66 years of age and had been a sufferer for years.

Samuel Cartwright, aged 66 years, and brother to William Cartwright, who died within 36 hours, died at his home in East Liverpool, O. They were interested in the Cartwright Pottery.

Lawren W. McCollum, secretary of the W. S. Dickey Clay Mfg. Co., Kansas City, Mo., died at the hospital in Macomb of peritonitis while on a business trip. He was 53 years old and for 17 years with the above company.

John E. Pinkham, a prominent brick maker of Dover Point, N. H., died suddenly at his home of heart failure. He was 71 years old and had been engaged in the brick business since early life. O. L. Pinkham, supt. of the Fiske Brick Co., is his only son.

J. A. Saigne, general supt. of the Bibbs Brick Co., Macon, Ga., died on a southern railway train. He had been on a 10-day trip and was returning home. When Macon was reached it was found he had died of heart trouble, and his body was taken from the train.

DEALERS INDICTED FOR BREAKING ANTI-TRUST LAW.

John T. Windsor, William Windsor, Walter Akers, Alfred Akers, William F. Keller, William Cooper, James C. McCausland, George Carmichael, brick manufacturers and dealers, at Akron, O., were indicted today by the grand jury, charged with operating a brick trust. It is alleged that as members of the Akron Brick Exchange, they created restrictions in the trade of brick throughout this county and state, prevented competition and fixed a standard price and figure on brick.

ACCIDENTS, DAMAGES AND LOSSES.

Frank W. Baitey was accidentally killed in the machinery of the Table Rock (Nebr.) Clay Co.

Wm. Doty, an employe of the brick yard at Beecher, Ill., was run down and instantly killed by the C. & E. I. Ry. train.

The 50,000 gallon tank of the Georgia Vitrified Brick & Clay Co. at Campana, Ga., collapsed and caused a complete loss to the company.

John Thomford, an employee in the Crookston (Minn.) Brick & Tile Co., was seriously injured in the clay bank by same falling upon him.

The jury awarded Rosanna Palin \$4,500 damages for the loss of her husband who was employed and killed at the works of the Cary Brick Co., at Troy, N. Y.

G. W. Sjoblad, a teamster in the employ of J. W. Graham, the Rock Island, Ill., brick manufacturer, was almost instantly killed by being kicked in the head by a horse.

A terrible explosion occurred in the William Blunt Pottery, East Liverpool, O., which wrecked a kiln and ruined the ware. Gas caused the accident. No one was injured.

John Neibert, president of the Muscatine (Ia.) Brick Co., broke his leg while playing baseball at a picnic. His son made a slide to third base and struck his father, breaking his leg.

John Sekerski, a workman, was crushed to death by tons of clay falling upon him at the brick plant of the Grand Rapids (Mich.) Brick Association. He leaves a widow and four children.

The Potteries Selling Co., Trenton, N. J., has enjoined the Resolute Pottery Co. of Trenton, N. J., from manufacturing or selling the water closets made under the Frame and Neff patents.

The Findlay (O.) Hydraulic Brick Co. has been sued for \$10,000 damages for the loss of the life of Duszo Buczko, who was run over by one of the company's wagons while the driver was reading a book.

The creditors of the Wooster (O.) Shale Brick Co. voted to accept the bid of Albert Shupe of \$9,560 for the plant which was sold under bankruptcy. Same will be put in repair and operated by Mr. Shupe.

The York (Pa.) Brick Co. has been adjudged a voluntary bankrupt and a receiver appointed. The liabilities of the company are \$12,000, assets \$7,000. Wm. Stambaugh and John Plonk organized the company several years ago.

George Miller, an employe of the Ottawa (Kansas) Brick & Tile Co., was seriously hurt at the plant by a pile of brick falling on him. The bones in the leg were so shattered that they protruded, and he received a scalp wound.

Serious charges are made against Frederick Bach, president of the Bach Brick Co., Chicago; Wm. Bach Jr., vice-president; Otto Bach, secretary, and Emil Bach, Julius Bach and Henry Bach, by the trustee of the bankrupt estate of Marie Muller. The bill claims that they have \$15,000 worth of property owned by the woman.

THE HUDSON BRICK YARDS TO REOPEN.

Kingston, May 31.—The Hudson River Brick Manufacturers' Association of the Kingston district yesterday afternoon decided that the yards operated by its members should reopen for business, and some of the manufacturers announced that they would begin work today, while others found it impossible to get ready before Monday.

No discrimination will be made against employees, it was announced by the manufacturers after the meeting had adjourned, and men will be employed whether they belong to the International Brick, Tile and Terra Cotta Workers' Alliance or not. In other words, the manufacturers will run "open" yards.

Before the meeting an effort was made by Robert W. Hawthorne, state mediator of the state labor department, to arrange a meeting between the manufacturers and a committee of the alliance, but the manufacturers refused to assent to the proposition, and said they would adhere to their original purpose not to recognize the union in any way.

Finding that the good offices of the state labor department were not acceptable to the manufacturers, and with no immediate prospect of violence at any of the yards, Mr. Hawthorne left town late in the afternoon for New York city, where he has been busy adjusting the strike of the funeral coach drivers.

The manufacturers regard the strike as broken, and they give credit to the Hutton Company of this city for making the start at work which they have followed. They do not anticipate any further trouble, and believe that the men will gradually return to work, regardless of the union affiliations.

The International Alliance, on the other hand, does not believe that the manufacturers will be able to continue at work throughout the season without trouble, and says that legal proceedings will be taken, as announced, by ex-Senator Jacob A. Cantor of New York city, who is their counsel, to prosecute the manufacturers for alleged violations of the labor and other laws. A fight against alleged unsanitary conditions will also be kept up, it says, until conditions along the yards are made as sanitary as anywhere else.

Work on several of the brickyards continued today without any trouble resulting. No attempt was made to stop the men who have gone to work to break the strike, and the manufacturers claim they have the backbone of the strike broken. Vice-President Butterworth of the Brick Workers' National Alliance laughed last night when asked if the union men were joining the ranks of strike breakers as the manufacturers say. He said that from reports received he believed that less than thirty men had deserted the union. This showing out of 2,700 union men in this vicinity was a remarkable one. Mr. Butterworth said it was a good sign when the strikers had returned from Glasco without becoming engaged in a riot with the non-union men who were armed. "But," said he, "there is no telling what may happen if trouble breaks out again in some other year. The men have kept quiet with no sign of a break from either side. Should differences arise at some future time there will be no holding the hot-headed ones and this place will be a small hell on earth."

Already many men have left this part of the country and are seeking work at brickyards which are not affected by strikes. A great many are working at Haverstraw and a number have gone to the Catskills to get work on the New York water system. A large party of Roumanians who came east about the time the coal strike was threatened have gone back to Pennsylvania.

PRESIDENT FINANCES BIG BRICK COMPANY.

N. L. C. Kackelmacher, president of the Columbus (Ohio) and Hocking Coal and Iron Co., arrived in New York to complete the organization of their mammoth brick company, which is to be the largest in the United States, with a capacity of 500,000 bricks a day, to cost \$1,000,000. Their engineers are now perfecting their plans, and they will break ground for their works on the Ohio River at Hocking Valley in three weeks, where they have immense beds of clay, for which the Ohio Valley is famous.

It was learned that Mr. Kackelmacher had been successful in having the whole amount required underwritten.

With regard to the coal situation, Mr. Kackelmacher says the strike is not yet settled and a settlement is not yet in sight. But had it not been for the attitude of Mr. Robbins in Pennsylvania the miners would have been glad to renew the old scale of wages. As it is, it is impossible to predict the outcome now that the State politics of Pennsylvania is involved, as there is believed to be an agreement with the miners to send Mr. Robbins to the United States Senate, in return for his support of their cause. It is given out by their side that the Steel Trust is back of Robbins in this deal, but the trade does not credit it, though it is not opposing it.

ANNUAL OUTING OF BROTHERHOOD OF OPERATIVE POTTERS.

The annual outing of the National Brotherhood of Operative Potters of the western district will be held this year at Rock Spring Park, Chester, W. Va., June 4. It is being arranged to make the event the greatest of its kind ever held by the Brotherhood.

For three months the national officers have been working on the outing. A special train is to be run from every town in which a pottery is located. The train from Coshocton will come from the most distant point, although many are expected to come here from the Columbus shops, by making the trip to Coshocton the night before and coming east on the special.

A silver cup is the prize set up by the Brotherhood for the winning ball team. The contest this year will be between a team from the Niles shop and a team from Jig-germans local No. 12 of this city.

A prize of \$25 is offered the winning team in the tug of war. These teams have been selected from local No. 12 and Kilnman's Local No. 9.

Over 20,000 people are expected at this reunion. The outing has increased in attendance annually.

BRICK PLANT MERGES

The Tulsa (I. T.) Vitriified brick plant and Tulsa Red Fork brick plant were consolidated yesterday. E. B. Howard becomes president and general manager of the merger. The consolidated plants have a daily output of 75,000 brick, which will be increased to 100,000 at once. Tulsa is very fortunate in possessing a good quality of brick shale and brick making is becoming a prominent industry here.

MR. MCCOLLUM DIES IN A HOSPITAL AT MACOMB.

Lauren W. McCollum, secretary of the Dickey Clay Manufacturing company of Kansas City, Mo., died at a hospital at Macomb, Ill. While on a business trip he was stricken in that city with peritonitis and inflammation of the bowels. An operation was performed. His wife and his daughter, Mrs. J. Will Merrill, Jr., were at his bedside.

Mr. McCollum returned in April from a three-month trip to the Philippine islands and Hawaii. He went to New Orleans and Chicago on business and had stopped at Macomb on his way home when he became ill.

Mr. McCollum is widely known in the clay manufacturing business. He was born in Buffalo, N. Y., fifty-three years ago and was reared in that city. There he became an early day friend of Grover Cleveland. The two, when young men, were members of the same club and played whist together in the days when Cleveland was just entering politics as sheriff of Erie county. Mr. McCollum did newspaper work in Buffalo, holding a position for several years in the advertising department of the Commercial Advertiser. He then went to Des Moines for two or three years, having charge of the construction of the Gilbert starch manufacturing plant there. About twenty years ago Mr. McCollum came to Kansas City and was first employed by the Keith & Perry company. He afterwards became manager of the Deepwater Clay Manufacturing company, which was bought by Walter S. Dickey in 1889. Since that time McCollum held the most responsible position in the sales department of the business. He has traveled for the company in the Philippines, Japan and China.

McCollum was chairman of the finance committee of the Republican city committee in the spring campaign and was treasurer of the Republican county committee. He was a member of the Ivanhoe lodge of Masons, the Knife and Fork club and the Commercial club.

Mr. McCollum was the adviser of Mr. Dickey in all the important steps connected with the building of the company's business. He had spent most of his time in the main office, but when there were particularly important contracts to work for or new territory to develop McCollum was the man sent out from headquarters. He was a strict business man with high ideals and everything he had to do with was thoroughly systematized. That was true in politics as well as in business. McCollum was often the real planner for things that were worked out in the names of others. He had no liking for notoriety and when suggested for chairman of the Republican committee preferred to stand behind the chairman and to furnish ideas. But he always kept himself in the background.

TO BRING 5,000 SUITS AGAINST MANUFACTURERS UNDER THE STATE LAW.

Though the strike of the members of the Brick, Tile and Terra Cotta Workers' Union in the brickyards along the Hudson is practically ended, the fight against the manufacturers is not ended, according to Herman Robinson, the New York representative of the American Federation of Labor, in a report which he made to the Central Federated Union in New York.

"Under the present law," he said, "the men in the brick yards can work only ten hours a day. These men have been working twelve, fourteen and sixteen hours a day, and 5,000 suits for overtime are to be brought on their behalf against the employers. The suits will be prosecuted by ex-Borough President Cantor, and the fight will go on until the men in the brickyards get justice."

SAND OR LIME BRICK OR BLOCK NEWS.

W. E. Rice has started to make cement brick at Clarion, Mich.

Ed. Stott, Darlington, Wis., is making cement brick at the above place.

Parish & Bomme, Roseau, Minn., are preparing to go into the cement, brick and concrete business.

Jas. L. Aiton, Alexandria, Minn., has added a cement brick machine to his tile and cement block factory.

The Washington (N. C.) Investment Co., W. E. Jones, manager, will establish a sand-line brick plant there.

Sall & Brooking, Peoria, Ill., manufacturers of cement blocks, have decided to go into the cement brick business.

George Finck, 135 Broadway, New York, desires to communicate with firms that make sand brick machines.

A new sand-lime brick industry will be established at Brantford, Ontario. Necessary machinery will cost \$30,000.

A. W. Mertens, International Falls, Minn., recently purchased a cement brick machine, and will manufacture brick.

J. S. Crue and J. C. Perry have formed a partnership for the manufacture of tile and cement brick at Tekamah, Nebr.

The Inter-Mountain Building & Supply Co., Boise, Idaho, are now installing their machinery for their sand-lime brick plant.

H. S. Bowler, Gloversville, N. Y., has applied for a patent on a cement brick machine, which operates by hand, making 500 brick per hour.

W. D. Schultz has been appointed managing director of a sand-lime brick company at Brantford, Ontario. The plant will cost \$40,000.

The Seminole Pressed Brick Co., Jacksonville, Fla., has been incorporated with \$35,000 capital stock to make sand-lime brick. R. Cay is president.

H. J. Willetts and Mr. Webster have bought the cement brick plant on Wabash St., Michigan City, Ind., from Chas. H. Felton, and will operate same.

The Rockford (Ill.) Cement Stone & Brick Co. has been organized, and a plant is built on No. 2nd St. W. W. Sawyer and W. C. Sawyer are interested.

The Winchester Rock & Brick Co., Winchester, Mass., have lately called Robt. T. Edwards to their employ, in planning for their sand-lime brick plant.

The Ohlemacher Brick Co., of Michigan City, Ind., recently closed a contract with the Oliver Chilled Plow Works, at South Bend, for one million sand-lime brick.

The Lake Superior Sand-Lime Brick Co., Hancock, Mich., begun at once to rebuild their plant which was destroyed by fire. For 30 days they will work under a temporary shed.

The W. F. Barnes Co., San Francisco, Cali., who are the representatives of the Schwarz System on the Pacific coast, have secured a site on the Columbia River, 8 miles below Portland, Oregon, and will in a few days begin the constructing of a sand-lime plant.

MISCELLANEOUS ITEMS.

O. T. Cassidy is putting up a brick and tile works at Orange Grove, Miss.

Floey Brick Works, Downingtown, Pa., capital \$50,000, has been incorporated.

It is reported that R. H. Etheredge, Saluda, S. C., will establish a brick works.

William Adams of Denver, Colo., will start a brick works at Goodland, Kansas.

The Pennsylvania Clay Co., Philadelphia, Pa., has been incorporated with \$100,000 capital stock.

The Forbes Realty Co. is planning to establish a brick making plant on their property at Rensselaer, N. Y.

The Calesa (Ala.) Townsite Co. has located a brick and tile works in that town that will cost \$40,000 and employ 100 hands.

Quinn & Moritz, Revenna, Neb., have started to moulding brick. They have largely increased the capacity of their drying yards.

J. J. Lane, Newberry, S. C., has found a fine deposit of clay on his property and in all probability a brick yard will be located there.

Le Roy, Kansas, is to have a 100,000 daily capacity brick plant. The machinery has already been bought. E. F. Day and H. C. Waage are interested.

The Sheffield (Ala.) Brick and Tile Co. has been sold to Dr. A. D. Bellanmy of Florence. The plant is a large one, just equipped with a new outfit of machinery.

The Camp Conduit Co., Akron, O., has been incorporated with \$100,000 capital stock, by H. H. Camp, L. W. Camp, Anna M. Camp, Amelia Camp and Louise W. Camp.

The Mount Gilead (O.) Tile and Pottery Co. has been incorporated with \$15,000 capital stock by J. C. McCormick, H. E. Hubbard, J. A. Wilhelm, J. P. Price and R. J. Pumphrey.

The Independent Brick Co. of Trenton, N. J., have a large force of men at work building a brick plant on the meadows near the Pegin railway, about a mile north of Bordentown.

Buildings have been erected and machinery nearly installed for a brick making plant at East Chattanooga, Tenn. The capital stock of the company will be \$25,000. O. S. McCulley is president; Gordon McCluskey, vice president; and Samuel McCulley, secretary and treasurer.

The Kewanee (Ill.) Brick Co. has been organized, and has leased the plant of the Kewanee Mining and Mfg. Co., which was burned about 18 months ago. The plant will be rebuilt. R. E. Taylor is president; George Wilsey, vice president; Wm. Stanley, secretary; Moritz Roth, treasurer; and E. A. Mumford, manager.

L. O. Wilson, Fred Smith, R. S. Trulock, W. I. Goff and W. T. Beeks, all of Elkeno, Okla., have formed company with \$25,000 capital stock that will build a brick and tile plant on the Montrief-Ernest Brick Works Site. The company will be called the El Reno Brick and Tile Co.

Henry Lehman of Boston, Mo., is preparing to open up a tile factory on his farm west of the city.

John Newbower, formerly of Havre, Mont., has started operating the brick plant at Browerville, Minn.

The Capron (Ill.) Brick and Tile Co. has sold its plant to Munson Bros., who will fit it up in good shape.

Sunmit, Miss., is to have a \$25,000 brick making plant. Lucion E. Schilling of Magnolia is promoting the enterprise.

The firm of Fries & Burr, tile and brick manufacturers at Utica, Mich., has been dissolved, and C. E. Fries continues the business.

A deal has been closed whereby the machinery of the Home Brick Co. of Iola, Kansas, is to be removed to Le Roy, where it will be put in operation.

The Southern Kaolin and Aluminum Co., Blaney, S. C., has been incorporated with \$100,000 capital stock. They will mine and ship kaolin and caustic soda.

M. C. Madsen, Hutchinson, Minn., has completed arrangements to make tile at his brick yard. He has erected the buildings and put in the necessary machinery.

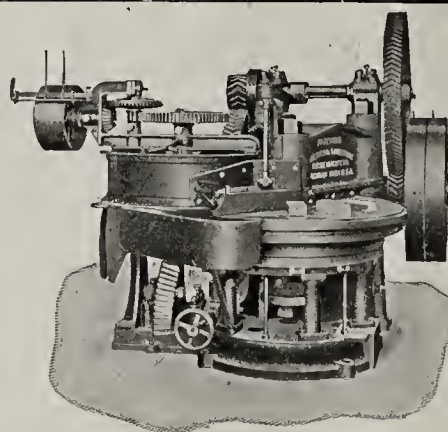
The High Ridge Hydraulic Press Brick Co., Chicago, has been incorporated, with \$21,000 capital stock, by Frederick Scholer, D. S. Roberts and John W. Petesch.

In this issue of THE CLAY RECORD is the ad of the Ohio Galvanizing and Mfg. Co., of Niles, Ohio. They have just patented a new steel brick pallet that has much merit.

The Armstrong (Ia.) Brick and Tile Co., have leased their plant to Ottawa, Ill., parties, who have the right to operate it under the lease until fall, with the privilege of buying.

Mark Ogan of St. Louis, Mo., recently married Olive Stafford of Buffalo, Mo., and they have gone to Tesla, Cal., where Mr. Ogan will have charge of the Carnegie Brick and Pottery Co.'s new plant.

The Williamsburg (Va.) Brick Co. recently bought the W. L. Jones brick yard and has remodeled and started same in operation. Melville De Baum, formerly of the Roseton Brick Co. of New York, is the president and manager; James Cathcart, Jr., is vice president; and Robert T. Boyd, is secretary and treasurer.



KOMNICK IMPROVED ROTARY PRESS.

install the complete plant and guarantee results, and are prepared to furnish complete or partial installation.

The American Sandstone Brick Machinery Co.

Saginaw, Mich.

One of these presses made 22M. brick each consecutive day of ten hours for more than six months without a breakdown. Another press made 4,235,000 the first ten months, ten hours per day run; is now making 35M. per day, day and night run. We were the first to introduce the Komnick or hydrated lime system in the United States; also to build and

Leck Bros., Adams, Tenn., have established a brick plant.

O. L. Feaster, Micanopy, Fla., wants catalogues and machinery for making brick.

The Center Brick Co., Howard, Pa., has been incorporated with \$5,000 capital stock.

The brick & tile yard of Richholt Bros. at Holgate, Ohio, is rapidly being pushed to completion.

Brick Mfg. & Construction Co., Franklinton, La., has been incorporated with \$10,000 capital stock.

Postmaster H. E. Hull has sold his interest in the Williamsbury, (Ia.) Brick & Tile Co., to Arthur Lewis.

E. E. Bumpus, of Ft. Collins, Colo., has purchased the Cody Wyoming brick works, and will begin the manufacture of brick.

The Mentens, (Ill.) Brick & Tile Co., has been incorporated with \$100,000 capital stock by John P. Hatch, Geo. W. Jackson and Daniel G. Lee.

The Venable & King Bros., Rockwood, Tenn., have leased the Brick & Tile Co's plant and moved it to the farm of Col. J. A. Shadden, where it will be put into operation.

The National Drain Tile Co., Terre Haute, Ind., will put in a \$50,000 tile plant at Springfield, Ill. The plant will be southeast of the city near the Springfield Paving Brick Co's plant.

The Wilson Brick Co., Windsor, Vt., has been incorporated with \$50,000 capital stock. Fred H. Young and A. E. Snow, of Springfield, Mass., and Arthur B. Clapp, of Brattleboro, Vt., are the incorporators.

The Winterset, (Ia.) Brick, Tile & Material Co. has been incorporated with \$10,000 capital stock. The officers are S. D. Alexander, president; T. F. Mardis, vice-president; W. L. Smalley, secretary, and W. C. Summers, treasurer.

The Empire Pressed Brick Co., of Spokane, Wash., has been incorporated with \$25,000 capital stock by Louis R. Demert, secretary; Ralph K. Green, president. They have bought the Shepard & Son brick plant at Rockford, Wash.

The Preston Brick Co., Kingwood, W. Va., has been incorporated with \$5,000 capital stock by A. B. McCrum, R. W. Monroe, P. J. Crogan, C. F. Shaw, J. A. Lenhart, Wm. Brown, Wm. Schaffer, and C. C. Pierce, all of Kingwood.

BUILDING SUPPLIES WANTED

The wonderful progress of Northwest and Western
Canada has created a tremendous demand at

WINNIPEG

for all classes of Building Material. We reach every Architect, Builder, Contractor and Engineer in Northwestern and Western Canada. We reach every Brick Yard and Clay Worker. Write us for full particulars, etc.

\$1 a year keeps you posted.

WESTERN CANADA CONTRACTOR

720 Union Bank, WINNIPEG, CANADA.

A RARE OPPORTUNITY.

One thousand acres of "Fire Clay" with lignite coal in abundance on adjoining land. Clay of the following analysis with a vein running from four to forty feet. Some of it shows the same analysis, except has much less sand.

ANALYSIS:

Telephone Connection.

CHEMICAL LABORATORY,

H. ENDEMAN, PH. D.

Analysis, Consultations and Researches.

23 William Street, New York, Aug. 9, 1904.

CERTIFICATE OF ANALYSIS.

For F. M. Greene, Atlanta, Texas;

I have examined the sample of Clay marked as stated below and find the following results:

It contains in 100 parts by weight—

Alumina	19.88	CLAY
Silica	20.95	
Hydrate water	6.03	
Oxide of iron	0.74	
Alkaline earths and alkalis	2.22	
Coarse sand (sample)	35.00	SAND
Dust sand	15.18	

This clay situated in Texas. Would like to put it in as stock with good people to develop it. Samples and full particulars on application.

F. M. GREENE, ATLANTA, TEXAS.

The Carrollton (Texas) Brick Co. has been organized with \$50,000 capital stock.

George W. Ford and M. F. Houck will establish a brick plant with 60,000 daily capacity at Louisburg, N. C.

F. W. Spinks will put in a \$75,000 brick making plant at Latonia, Ky. He will make 60,000 brick daily, using the Scott system of kilns, etc.

The new plant of the Maumee Brick & Tile Co., Ft. Wayne, Ind., located on the New Haven road east of the city, is now making brick.

The Darlington (S. C.) Brick Co. has been incorporated with \$20,000 capital stock. Bright Williamson and J. E. Blackwell are the incorporators.

James C. Riley and Roscoe L. Haefer are behind an enterprise to make 50,000 brick daily at Bloomington, Ill. The plant will be on the old J. B. Holmes site.

The New Lexington (O.) Press Brick Co. has been incorporated with \$80,000 capital stock by B. F. Rogers, C. H. Bell, J. W. McDonald, A. Farlinger and J. W. Fay.

The Nelson-Meyer Co., West Manchester, O., has incorporated with \$10,000 capital stock. Incorporators are: C. A. Nelson, W. E. Nelson, N. O. Myers, L. W. Nelson and A. J. Myers.

The Omaha (Nebr.) Brick, Paint & Pottery Co., 2nd and Hickory Sts., will have their plant in operation the first of August, making 50,000 brick per day. P. E. Iler is the president and manager of the company.

The Hocking Valley Tile Clay Co., owned by A. E. Magoon of Logan, O., and F. A. Freer of Nelsonville, have increased its capital stock from \$10,000 to \$75,000, and will build a new 20 kiln plant. A. M. Magoon will supervise.

A company has been organized at Anna, Ill., consisting of F. P. Anderson, F. W. Willard, F. M. Otrich and L. B. Tuthill. The capital stock is \$50,000. The company have a site leased at McClure, and have leased 2,500 acres of silica lands.

The Dunbar Co., Charleston, W. Va., has been incorporated with \$50,000 capital stock for the purpose of buying land and making brick and clay products. Incorporators are H. H. Young, E. A. Reid, L. S. Couch, and Geo. S. Couch, all of Charleston.

CLAY RECORD.

POSITION WANTED

Position wanted manager or superintendent of a first-class brick plant, any kind of brick or hollow ware. Can construct and equip any kind of plant, and take complete charge if necessary.
G, care Clay Record.

POTTERY FOR SALE

A two kiln pottery for sale in Philadelphia, Pa., conveniently located to P. R. R. Co., to P. & R. Ry. Co. and to Wharves. In running condition for the manufacture of any line of pottery ware. Kilns 16½ feet, up draft, with decorating kiln, all as good as new. Address
2539 E. Clearfield St., Philadelphia, Pa.

WANTED

A practical man with from five to ten thousand dollars to use in promoting a number one pressed brick plant in a hustling town, and afterwards to take charge of plant. Must be a practical pressed brick man.

Promoter care Clay Record
Chicago, Ill.

FOR SALE

Two Sturtevant Fans, Pipes and Fixtures for waste heat drying.
One Steam Pump.
Eighty (80) Double Decked Dryer Cars. Address
Shupe & Barnhart Shale Co.
Wooster, Ohio

WANTED TO NEGOTIATE.

The undersigned owns 60 acres of land immediately upon the the Great Texas & Pacific Railway, west of Fort Worth, Texas, 47 miles, and 79 from Dallas, Texas, upon which there is a mountain of 20 acres of as fine brick and tile shale as and be found anywhere. Thickness of shale 40 feet above ground of valley surface, and thicker still below. Makes a cherry red brick. Wish to have a strong company formed and will take stock. Convenient to coal and water. Fine sale for product. Invite correspondence.
E. W. MORTEN,
Farmersville, Texas.

FOR SALE.

An interest in my tile and brick plant, to one of experience, that can take charge and run it. Must be able to invest some money in plant. Plenty of good clay at back door, and good market at front door. This is an opportunity that you don't often run up against. Plant now running. Come and see or write

S. H. RECORD,
Charleston, Ill.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address
T, care Clay Record,
Chicago, Ill.

FOR SALE.

Chambers End Cut Brick Machine, capacity 3,500 brick daily. 75 double deck roller bearing stiff mud brick cars.
STEELTON & HARRISBURG BRICK CO.
Steelton, Pa.

PARTNER WANTED.

A good, reliable man of experience, with some capital to invest in and take charge of a new Dry Press Brick Plant. Plenty of shale, and good market for all the brick. Address
DENIS, care Clay Record,
Chicago, Ill.

WANTED.

A man who understands brick making in all its branches, and who has \$5,000 to \$10,000 to buy an interest in a large brick plant in the West, and take complete charge of same at a good salary. Plenty of business at good prices; no competition. Owner has other business and wants some one interested who can run the plant. Address,
"West," Care Clay Record, Chicago.

Machinery For Sale.

FOR SALE CHEAP.

One Atlas Engine, 35 horsepower. One Atlas Boiler, 50 horsepower. One Hercules, Sr., No. 108 Brick Machine. One Sander. One Turn-table. One 20 barrel Galvanized Iron Tank for washing moulds. One 4-spring Truck. Three Hand Wheelbarrows. Six Brick Wheelbarrows. One Disintegrator, Belting, Shafting, Pulleys. 85 Brick Moulds. 44 Iron Kiln Doors. 175 Kiln Grates. All of this property is nearly new and will be sold at a great sacrifice. For further information, write to A. J. WARD,
Holland, Mich.

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine.
Address "GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.

THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets, 10x34 inches. Address
ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address
ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new.
DEALER,
Care Clay Record, Chicago, Ill.

MACHINERY WANTED.

Second-hand 9-foot dry pan, screens, elevators, pug mill, large size Chambers' brick machine, belting, pulleys, cable and dump cars. Also 150 to 250 h. p. Corliss engine, and two 100 h. p. boilers.
J. O. C., care Clay Record, Chicago.

FOR SALE.

A brick and Tile plant, equipped with up-to-date machinery, 60,000 daily capacity, down draft kilns, inexhaustible bed of best clay suitable for all kinds of building, facing and paving brick, drain, tile, sewer pipe, etc., on two railroads, demand very good. Address
B, care of Clay Record.

FOR SALE.

A going, money-making hollow block plant. Best location in Ohio. Also well equipped for face, common, paving and common brick. Includes coal mine and 125 acres of four foot Cambridge coal, overlaid with shale and overlaid with fire clay. Good prices and more orders than can be filled. Plant comparatively new and in excellent condition. Will be sold at \$40,000, two-thirds original cost, one-half cash and one-half credit. Good reason for selling. Address,
THE GUERNSEY BRICK & CONSTRUCTION CO.
Cambridge, Ohio.

FOR SALE.

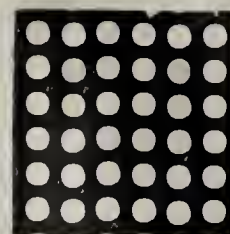
2,000 ft. 12-lb. steel rails, used one season.
11,000 32-lb. x 9¼-lb. No. 1 White Pine Pallets.
One set Brick Moulds, new, 9 x 4¼ x 2½ inches.
One 48-in. Leviathan Belt for Potts' Sander, new.
One Potts' Dump Table, used one season.
RIVERSIDE BRICK CO.
Green Bay, Wis.

FOR SALE OR TRADE.

One Standard Brick Machine, steam power, 30,000 capacity. 24 new Brick Moulds. 11,000 Pallets. Three Off-Bearing Trucks. All in first-class condition. Owner, E. J. SWARTZ & SON,
Syracuse, Ind.

FOR SALE.

One Model "B" Four-Mould Dry Press, used only a short time, thoroughly overhauled.
Model B, care Clay Record, Chicago.



PERFORATED METALS

for all purposes
Prompt shipment of all orders guaranteed.

H. S. SIMPSON,
817 Chamber of Commerce
Chicago, Ill.



Paper Joggers quoted.

R. A. HART, 41 White St.,

No better made, cut from \$8 and \$10, to 4 Wheel, \$3.00 5 Wheel, \$3.25 Guaranteed.

Sold by all dealers.

BATTLE CREEK, MICH.

FOR SALE CHEAP.

First-class brick and tile plant. Good machinery. unlimited clay supply, 25,000 capacity daily, 3 kilns 170,000 capacity, dry sheds, etc. Track connections, A snap if taken at once. Address

H. C. MODLIN, Secretary,
Perry, Iowa.

ENGINES AND BOILERS.

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

FIRE CLAY LANDS.

500 acres underlaid with heavy vein superior fire clay and light vein coal, which can be mined cheaply, on the line of the N. Y. C. & H. R. R. R., in Pennsylvania, for lease on royalty at low price per ton. For further information address the owner.
BOX No. 308, Williamsport, Pa.

FOR SALE OR EXCHANGE.

One of the best small brick and tile plants in Southern Michigan. 20,000 capacity, Stewart patent kilns, good drying sheds, all machinery in first-class condition, fine clay, good market. Will sell at a bargain or will exchange for good real estate.
Address,
MICHIGAN,
Care Clay Record, Chicago

STEAM SHOVEL FOR SALE.

Barnhart style "B," good condition, large enough to dig clay for 100,000 brick in 8 hours. Apply to
ILLINOIS BRICK COMPANY,
918 Chamber of Commerce,
Chicago.

FOR SALE.

One 5-ft. Style American Dry Pan, practically new. One 10-hp. Gasoline Engine, complete.
KIAMENSI CLAY CO.
Newport, Del.

9-FT. DRY PAN WANTED.

We could use another Dry Pan and will buy at once if good and cheap. Will buy 25,000 capacity Stiff Mud Machine and Pug Mill and Dunlop Screen.
GOETZ PRESSED BRICK CO.
New Albany, Ind.

BRICK PLANT WANTED

Wanted to buy or lease a brick yard for making red brick.

RED BRICK
169 Division Street, New Haven, Ct.

SAND LIME PLANT.

Huennekes System Plant, including best Four-Mould Boyd Press, Jeffrey Sand Dryer and Conveyor; all practically new and in good condition; will be sold at less than half of construction cost. Address, SAGINAW PRESSED BRICK CO.
Saginaw Mich.

FRANK TOOMEY

127 and 131 North Third Street.
PHILADELPHIA, PA.

Great Assortment, 3,200 Pieces.	ENGINES, CORLISS. Automatic, Steam	Slide Valve, Pumps, Dynamos, General	Machinery of all kinds Rebuilt and Guaranteed. Immediate Delivery. Send for List of Stock
--	---	---	--

Brick and Mortar Coloring

After twenty years "Clinton" colors still stand at the head. Get the genuine, with the "Little Yellow Side-Label."

CLINTON METALLIC PAINT CO., Clinton, N. Y.
CORRESPONDENCE SOLICITED.

WARNING

NOTICE is hereby given that the process of drying and burning brick by first setting green, undried brick in horizontal courses in a kiln to form a layer thereof, then covering and drying such layer, and successively coursing, capping and drying separate layers of green, undried brick upon the last dried layer until all the layers are thoroughly dried, and then burning, is patented in U. S. Letter Patent No. 485199 to J. C. Kenzel, dated Nov. 1, 1922, and all persons are hereby warned against using such processes without grant or license from the undersigned owners of said patent. Unauthorized use of the patented process will render the user liable to an action for infringement and the payment of damages to the owners of the patent, whose rights thereunder will be strictly enforced.

J. C. KENZEL,
J. S. KRAUSS,

P. O. Box 271.

128 Logan St., Knoxville, Tenn.

Refractory Cement

(So called because it is worked the same as cement)

A high refractory composition that can be used the same as cement, cured and put to use in twelve to twenty-four hours, and will endure any degree of heat that fire-clay products will.

Applied to the inside of a kiln it will protect the walls and give increased refractivity; will reduce the cost of repair, and save fuel in any kiln.

Every boiler furnace should be lined inside with "Refractory Concrete." It will protect the walls and increase the heating capacity by preventing radiation.

For insulating steam pipes this composition is guaranteed equal to asbestos or magnesia felt; the cost per foot to cover a 3-inch to the thickness of 1 inch will be 4c.

Refractory brick of a high order can be formed from the composition on any cement brick machine.

For flue linings, chimney blocks and tops, floor and partition blocks, conduits for electric wires, etc., this is the ideal material.

Refractory Concrete can be combined with any aggregate used in the formation of cement products.

For information pertaining to your particular requirement, and prices, address.

E. R. STOWELL

NEW CORYDON, INDIANA

The Burlington Route

calls attention to manufacturers seeking a new location to its Industrial Department. This department is established for the benefit of manufacturers. Information on the three Rs of manufacturing—Power, Raw Material, Market—can be had by writing



W. H. MANSS,

Industrial Commissioner,

209 Adams St., CHICAGO.

CLAY RECORD IS A SEMI-MONTHLY

NOW READY—A TREATISE ON

PRODUCER-GAS and GAS-PRODUCERS

BY AN ACKNOWLEDGED AUTHORITY.

A 300-page book containing thirty chapters, giving the fundamental principles and definitions, calculations, classifications, manufacture and use; the fuel, the requirements, the history, its by-products, **Producer-Gas for firing kilns, steam boilers, and power plants.** The future of the Gas-producer and a bibliography.

OVER 100 CHOICE ILLUSTRATIONS—PRICE, \$4.00.

A subscription to the CLAY RECORD for one year without additional charge to those that are not now subscribers.

CLAY RECORD PUBLISHING COMPANY

CHICAGO, ILL.

**A NEW CLAY FEEDER AND MIXER**

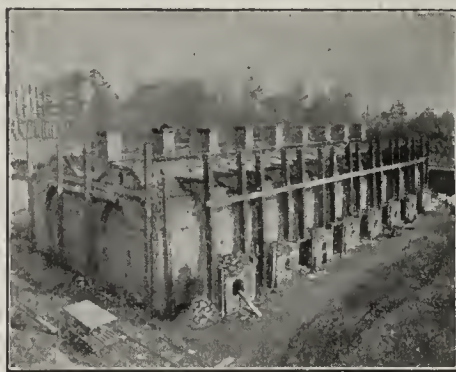
The Rust Clay Feeder has been brought out in response to a better method for mixing and feeding clay in brick, tile and all clay working plants. By the use of this feeder the services of two men are entirely dispensed with, the clay being dumped into hopper of machine from car is automatically fed into the disintegrator. The spirals draw their supply evenly from all parts of the hopper, mixing the clay perfectly, which tends both to improve and increase the output of the plant.

Send for full descriptive circular.

Marion Machine, Foundry and Supply Co.

Marion, Ind.

Something New In Brick Kilns and Dryers



The Dennis Double Chamber Up and Down Draft Brick Kilns and Direct Heat and Hot Air Brick Dryers show many new features that make them superior to all others. Economical, durable and strong in construction and operation, having many points of advantage that appeal to practical brick-makers. Patented April 14, 1903 and September 8, 1903. Brick plants installed and put in operation. Write for booklet. Correspondence solicited.

F. W. DENNIS,
145 Water St., Norfolk, Va.

Absolutely safe and reliable. Ask your friends

A WOODEN TOWER

Is a source of annoyance and danger. It is liable to rot and collapse at any time. A

CALDWELL STEEL TOWER

is safe, staunch and durable and will carry four times the weight of the filled tank. Expensive labor is not necessary to erect these outfits, your own men can do it. We furnish all plans.

Send for illustrated catalogue and price list.

W. E. CALDWELL CO., - Louisville, Ky.

Robert F. Wentz, M. W. S. E.

701 National Bank Building, Allentown, Pa.

DESIGNER AND BUILDER OF

Cement and Sand-Lime Brick Plants, Analysis, Tests, Examinations, Reports, Preliminary Plans, Estimates and Complete Drawings and Specifications for Modern Cement and Sand-Lime Brick Works.

We have designed, built and reconstructed twenty-two Cement Plants in the past twenty years.

We design and equip complete Cement and Sand-Lime Brick Plants with the most modern machinery.

THE HYDRO - MALAXATOR PROCESS for the manufacture of Sand-Lime Brick.

How to Use Portland Cement.

From the German of L. Golinelli.

Translated by Spencer B. Newberry, E. M., Ph. D.

A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.

22,000 copies sold in Germany.

Portland Cement Sidewalk Construction.

Compiled by P. B. Beery, and based upon the experience of many successful contractors.

A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.

FIRE! FIRE!! FIRE!!!

THE "CHILDS"
FIRE EXTINGUISHERS
APPROVED

and included in the list of approved extinguishers issued by the

National Fire Protection Association

SALESMEN WANTED

O. J. CHILDS CO.

Sole Mfrs.

UTICA, N. Y.

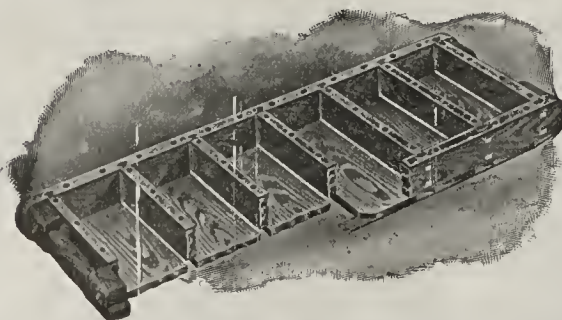


Brick Moulds and Brick Barrows

With Moulds and Barrows it is not the first cost, but it is, will they last? We have made them for over 30 years and know your wants. All kinds and shapes. A trial order will convince.

James B. Crowell & Son,
Wallkill, N. Y.

PERFECTION BRICK MOULDS



PATENTED JAN. 28, 1902.

THE ARNOLD-GREAGER CO.

Manufacturers of Brick Machinery and Supplies of all Kinds.

NEW LONDON, OHIO.

These are the kind of Brick Moulds the Brick Makers have always wanted but could not get till now. You can get a mould that the vents are right all the time. No change whether the Mould is wet or dry. Try a sample order. Satisfaction guaranteed.

H. M. DEAVITT,
PRACTICAL AND CONSULTING CHEMIST,
Garden City Block,
CHICAGO.

Analyses of Clay, Sand, Lime, Cement Materials and Shales a specialty.

Special attention given to the preparation of Clay Products from the raw material.

A well equipped laboratory and long experience in this branch of work enables us to give expert reports on obtaining glazes on refractory materials.

All enquiries in regard to the above will receive prompt attention.



CLAY RECORD

Vol. XXVIII. No. 11.

CHICAGO, JUNE 15, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

DRAINAGE LAWS.*

By D. A. KENT, of Jewell, Iowa.

The evolution of the drainage laws has taken place chiefly through the experience of the owners of the wet lands of Ohio, Indiana, Illinois, and Iowa. The Iowa law is the last enactment on the subject. In the formulation of the Iowa law it was attempted to summarize the laws of the other states and adopt their best principles. This, we think, has been fairly well done with some exceptions that will be noted in the body of this paper.

I am pleased to note the interest that this convention has always taken in the matter of drainage laws. You are to be complimented for being alive to your best interests. The manufacture of drain tile has formed a large part of your industry and it will continue to do so for a long time. You tile makers will have to manufacture something like fifty million dollars worth of tile before the drainage of our state is well done. We have about 6,000,000 acres of land to drain and it will require fully \$50,000,000 worth of tile to finish the work.

I apprehend that at this time you desire a discussion of the practical operation of the new drainage law.

The chapter of the drainage laws that was enacted at the session of the last General Assembly provides only for drainage through the organization of a drainage district, and for private drainage on the farmer's own land when he terminates his drain within the boundaries of his own land and in the natural water way. This new statute provides two methods of procedure: First, by petition of one or more interested land owners; and second by the mutual agreement of all the interested parties. This latter method is highly commendable and much to be preferred. It does away with a large part of the expense in the preliminary proceedings, and avoids the contention, strife, litigation and delay that almost uniformly follows the first method.

To proceed under the second method, requires reasonable men, and men who know enough of the subject of

drainage to determine what is right and then, knowing the right, be willing to do it.

Under this method the expenses of appraisers for both benefits and damages are avoided. Also the expense of serving notices, calling witnesses, spreading the tax and attending the various meetings of the board of supervisors. And we may well add, the vast expense of bad blood and neighborhood quarreling. A ditch, by mutual agreement, becomes corporate property as soon as all the articles pertaining thereto are properly expressed in writing, duly signed, acknowledged and filed with the County Auditor. The board of supervisors will then take jurisdiction of the ditch, construct it and maintain it.

A ditch by petition requires more elaborate work, and entails expense, and this method should be pursued only when there are certain interested parties who are not willing to do what is right between man and man. In the institution of a drainage proceeding by petition, there are but few questions to be decided, chief among which are the questions, is the drainage practicable? who are benefited and to what extent? Who are damaged and to what extent? The utility of a ditch is practically established by the statute, and whenever a board of supervisors have been properly petitioned it is their duty to proceed with the preliminaries leading to the establishment and construction of the ditch or drainage improvement. The questions for review by the courts, are the form and matter of the petition; the regularity of the proceedings; the equity in the assessments of benefits; the justice in the awards for damages; the competency of the board of supervisors and its commissioners of appraisal and the action of the board in its findings for or against the petitioners. These questions give broad grounds for appeal and preclude the possibility of any man being robbed of his rights if he attends to his business in the initial proceedings. The grounds for appeal are so specifically pointed out, that no one needs to be at a loss to know his rights in any particular.

The drainage laws provide for the drainage of an individual farm through the organization of a subdistrict when

*Read at the last meeting of the Iowa Brick and Tile Association.

the farm lies within a drainage district. But there is no law permitting a private land owner to drain through the land of another without his consent. There is a constitutional amendment pending; which has for its object the preparation of the way for laws that will properly provide for such cases. Hitherto the doctrine of personal liberty has been strangely applied in the matter of inter-farm drainage. It sounds very great to trumpet the principle that a man is lord of his own castle; and master of his own frog ponds; but personal rights cease where civil rights begin. Blackstone defined these rights most comprehensively when he demonstrated a natural, as a savage right, in distinguishment from civil rights. There is no essential difference between the corporate bodies of a city or town and a civil township, and if a man owns a lot in town, the town council has no hesitancy in going straight after a tax for the purpose of constructing a drain or sewer or pavement that will improve the lot owner's property or the town property in general; but if the township trustee undertakes to tax a lot in the country for the construction of a drain the act is at once declared unconstitutional, the improvement is stopped, and the lot owner looks with imperious derision on his enterprising neighbor.

Moreover the statute empowers the trustees to compel the joint owners of the boundary line between farms to construct partition fences jointly; and pay for the same share and share alike. But the statute is hushed when the trustees come to the question of compelling joint action in the construction of a ditch along a water way that is owned in common by two land owners. The courts draw the line between a post hole and a tile hole.

Section 44 of the new law should be amended so as to compel a tax according to benefits on all lands benefited by a ditch draining the highway. The present form of this section provides the way for the man with a pull, to get his land drained at the expense of the township.

Section 40 delegates the power to the Board of Supervisors to buy an outlet for a ditch leading into an adjoining state. This section is lame in that it does not confer power upon the board of an adjacent county in another state in the same manner as the provisions for a ditch in two or more counties. Sections 18 and 19 pertain to crossing the right of way of railways. These sections read very nicely until we come to the provision where the cost of construction of the improvement over the right of way shall be considerably as an element of damage. This iniquitous provision should be stricken out. The railways of the state receive as much benefit from the drainage of the wet lands as the land owners, and they should be able to see their interest and not be a thorn in the side of every drainage proposition that comes up.

Under the liberality of the present law, they should show their good will by being content with reimbursement for the actual cost of making the improvement over their right of way; but instead they file claims for damages in some instances that would blush the face of a New York grafter.

Under Chapter 2, Title X of the Code, there are two

methods of procedure: First by petition signed by a majority of the abutting land owners and, second, by a petition signed by a hundred free holders in the county. The first form of petition is objectionable in that it may exclude interested parties who are not abutting land owners, and in that, it lodges too much of the preliminary proceedings with the county auditor. The second method is decidedly objectionable in that it qualifies men who have absolutely no interest in the improvement to sign the petition. They sign the petition therefore because they dislike to say no to the petitioner, and then probably turn around and sign a remonstrance because they have the same dislike to say no to the remonstrator. The old law is practically a dead letter in the light of the new law. The question of determining benefits requires more good business sense than the administration of all the rest of the law. Section ——— lays down a guide which, if intelligently followed, will lead to an equation of interest with mathematical precision. The basis for determining benefits lies in parceling out the land that receives the most benefits. These parcels should be marked 100. Then every other parcel of land in the district will be benefited a certain per cent of 100. This per cent must be determined from two standpoints. First, the amount of wet land each parcel contains; and second, whether the benefit is direct or indirect. A direct benefit follows, in all cases where the main ditch affords an immediate outlet for lateral drains, an indirect benefit obtained wherever it is necessary to organize a sub-district to afford drainage for the lands in question, and in this case the amount of benefit lies in the relation of the sub-main to the main drain. That is, if the sub-main discharges one-tenth as much water as the main, then the land drained by the sub-main should be assessed one-tenth of the cost of the main drain from the junction to the terminus, and this assessment should be apportioned in the same manner as prescribed for the main ditch. To make the matter more plain we will assume a drainage problem and give the solution. We will assume that we have organized a basin comprising 5,000 acres into a drainage district and that the cost of the construction of the main ditch will be \$25,000. We will assume that there is a railway running through the district and that the benefits to the railway are \$1,000. We will also assume that the highways of the district are benefited in the sum of \$2,000. This leaves \$22,000 to be levied on the lands of the district in proportion to the benefits. Now we will suppose Smith, Jones, Brown and Williams each have 120 acres of land that is benefited more than the rest of the land. Their classification number therefore will be 100. Then Oleson, Peterson, Larson, and Swanson each have 160 acres that is benefited only $\frac{3}{4}$ as much; then their classification number will be 75. Then Frederickson, Koof, Arens and Fritz, each have 400 acres which is benefited only $\frac{1}{2}$ as much as the highest classification number. Their number will be 50. Then there are McDonald, O'Connell, Flannigan, and Muldoon whose classification number should be only 25 and they each have 240 acres. Then there are Johnson, Thompson, Anderson, and Christianson who each have 80 acres and whose classification number should be

10. Then there is Crawford who has 120 acres away up in one corner of the district which is not much benefited and his classification should be 5. Now multiply each owner's acreage by his classification number and this product will be so many acres at 1 per cent. Find the sum of all the products and divide the amount to be raised on the land by this sum. The quotient will represent the amount on one acre classified at one per cent. Then multiply each owner's product by this quotient, and the resulting product will be his correct assessment. The following table illustrated the solution of the problem:

Total Cost of Ditch.....	\$25,000.00
Amount assessed against highway..	\$2,000.00
Amount assessed against railway...	1,000.00
	\$3,000.00 3,000.00

Balance to be assessed against land.....					\$22,000.00
Names of owners.	No. acres.	Class. number.	Product.	Assess. on, 1 acre.	Each own's assessmt.
Smith	320	100	32,000	.07741	\$2,477.12
Jones	320	100	32,000		2,477.12
Brown ...	320	100	32,000		2,477.12
Williams .	320	100	32,000		2,477.12
Oleson ...	160	75	12,000		928.92
Peterson ..	160	75	12,000		928.92
Larson ...	160	75	12,000		928.92
Swanson ..	160	75	12,000		928.92
Frederickson	400	50	20,000		1,584.20
Koof	400	50	20,000		1,584.20
Arens	400	50	20,000		1,584.20
Fritz	400	50	20,000		1,584.20
McDonald .	240	25	6,000		464.46
O'Connell .	240	25	6,000		464.46
Flannigan .	240	25	6,000		464.46
Muldoon ..	240	25	6,000		464.46
Johnson ...	80	10	800		61.92
Thompson .	80	10	800		61.92
Anderson ..	80	10	800		61.92
Christianson	80	10	800		61.92
Crawford .	200	5	1,000		77.41

\$21,999.79

The elements of damage consist of the area of the right of way for the ditch. The number of bridges required for crossing and any injuries to crops that may result during the construction of the ditch. In the nature of things no general claim for damages should be allowed. Because the water way existed before the ditch was constructed and the ditch is assumed to be an improvement of the old water way instead of a damage to it. The only reasonable exception that can be taken to this position is the instance wherein it is necessary to condemn land uninjured by the old water way for an outlet for the new water way. I am of the opinion that the right of way for the new ditch is not a righteous element of damage. The land through which the old water way meandered is always comparatively valueless, and the new water way is made to improve it. It is therefore absurd to claim that it is both damaged and improved by the same act.

The matter of fencing the ditch should be controlled by the board of supervisors and should not be considered as an element of damages. They should determine what fencing is necessary for the protection of the ditch, and, in as much as all ditches will **not need fencing**, and in some instances, only the deep sections, the fencing should be a part of the original cost of the improvement.

ARCHITECTURAL EFFECTS BY JUDICIOUS USE OF CLAY WARE.

By GEO. E. HALLETT, Architect, Des Moines, Iowa.

The products of clay employed in architecture, embody those coming under the head of brick, tile and terra cotta. The term terra cotta covers all of the various products save those coming more distinctly under the head of brick and tile, therefore the term terra cotta covers not only such products as exterior facings, ornamentation, etc., but a great deal that would be purely structural, such as fire-proof floor arches, partitions and other fire proofing.

Probably the greatest development in the last few years as well as the future developments and uses of clay products in the construction of buildings, will be found under this general head of terra cotta.

The wonderful development in the last few years of clay products, their popularity and extensive use in building construction throughout this country, is due to the demand for the more permanent and fire-proof construction in buildings.

The successful introduction of this material in architecture dates from about the year 1880. The lack of progress and development prior to this date was largely due to the improper uses of these materials, as for example the definition of brick as given by the Encyclopedia of Britanica, "Brick—A kind of imitation stone made of baked clay."

This would indicate that stone from time immemorable had been looked upon as the ideal building material and any material proposed as a substitute, was considered as necessarily an imitation and therefore inferior. This idea gains further credit from the fact that the products of clay have always been cheaper than stone.

While to its cheapness can no doubt be attributed its ultimate successful introduction and later development, yet the mere fact of its being cheaper, operated against its proper uses, which was almost wholly responsible for the failure to successfully introduce it at an earlier period.

Terra cotta is probably the most enduring of all building materials, but like brick it was for many years looked upon as an imitation of stone and this was carried to the extreme of painting the terra cotta to correspond to the color of the stone it was desired to imitate.

While terra cotta has been used extensively in building construction in foreign countries for centuries, it is only within the last few years, comparatively, that it has come into general use in this country.

The abundance of timber and the comparative ease with which it could be converted into building material made it most available for the early buildings. Later came the use of brick with wood trimmings and ornament, then brick with stone trimmings, and stone buildings.

When we consider that buildings were even constructed of wood, designed to imitate stone and wood trimmings in imitation stone were applied to brick buildings, brick walls were plastered and marked off in imitation of stone courses and painted to imitate the color and effect of stone, it does not seem so strange that architects felt the necessity of painting terra cotta to imitate stone.

These ideas and practices prevailed in this country up to about 1880. About this date Mr. Geo. B. Post is said to have been the first architect to introduce the use of terra cotta in architecture as terra cotta, rather than an imitation of stone. He seems to have been the first to recognize the importance of adapting his design to the materials, which is now generally regarded as quite as important as the design itself.

The color adopted was red, which was no doubt the safest color to undertake at that time, if in fact other satisfactory colors might have been available at all. The particular shade of red used in this work was a light, warm red, which has become universally known as terra cotta color. This, therefore, marks the beginning of the proper use of terra cotta in this country.

While many earlier attempts were made to introduce it as a building material, the inability of the architects to separate it from stone and make their designs conform to the new material contributed largely to these failures to establish it in its proper place as a building material, divorcing it from stone and placing it on its own merit, made its wonderful development during the last twenty-five years possible. On the other hand, terra cotta has contributed a great deal in the development of architecture during this period, as for example the modern sky-scraper must of necessity be of steel frame construction and no material lends itself to this type of construction as does terra cotta.

The frame work of these buildings carrying the walls or outer coverings of each story independent of the stories below, makes great strength unnecessary and therefore makes it possible to reduce the weight of the walls to the minimum. The development in the manufacture of terra cotta makes it possible to meet most any condition and requirement of construction, as well as design and the great variety of colors and texture of surfaces to be had, meet all requirements of taste.

The time is not far distant when all buildings of any importance and that make any pretense of permanency will be built of fire-proof construction, terra cotta will be largely used in the exterior walls, and in interior construction in the shape of porous terra cotta.

I believe we will see burned clay similar to this porous terra cotta, made in a convenient form to be used as the aggregate for concrete, in the place of crushed stone and coal cinders now in use, in concrete floor and other construction. It would combine all of the advantages of both and be subject to none of the objections of either, cinders or broken stone, and would make cheaper construction than the terra cotta arches now in use.

While terra cotta has been placed upon a proper basis and will enter very largely into the architectural composition of the future building, as well as in the fire-proof construction, it is not due to the fact of its cheapness, but on account of its adaptability to modern architecture and building construction.

It must not be expected, however, that clay products will take the place of all other materials, as while better effects can be had by the use of terra cotta in certain cases, it

will also be found that certain other effects can best be obtained by the use of stone and as this fact becomes better appreciated and understood, its abuses will be decreased and its proper value as a building material more permanently established.

COLOR.

The colors of the earlier products of burned clay in this as well as other countries, were necessarily fixed and limited by the character of the natural clays, which in this country were almost entirely confined to the reds. This fact became so thoroughly fixed in the minds of the people that the suggestion of brick, conveyed to the mind the one color, red, save the one exception of the Milwaukee brick and this exception is made most notable from the fact that in later years when other colors were developed, they were compared to the Milwaukee brick, while brick made in China and Japan are invariably slate blue in color.

The later developments in color of brick runs parallel with that of terra cotta, practically no attempt was made to vary or control the colors until after 1880, as about this date terra cotta was started on its successful development in the one color of red, but the application of science and higher education has produced all colors and shades required, together with surfaces, textures and effects to meet all demands.

These same conditions prevailed in the manufacture of tile, if not to even a greater degree, as the earlier types of floor and other tile have been practically abandoned.

It is now not unusual to see, in a house even of moderate cost, a bath room entirely lined with tile, white vitreous for the floor, with glazed white or tints, with embossed enrichments in delicate and beautiful designs, for the side walls and ceilings, casings of doors, windows, etc., with bath room fixtures almost entirely of burned clay, solid porcelain tub, one piece lavatory, closet bowl and even the closet tank of porcelain or vitreous china, illuminating the use of wood in bath rooms almost entirely.

The development of American porcelain in bath tubs and lavatories in the last few years has been most interesting and gratifying when it is considered that these products are now being produced in this country, of superior quality, and at the same time at a very much lower price than the imported wares.

The manufacture of roof tile has also developed most extensively and are now to be had in various colors, of excellent quality of material and in forms that produce pleasing architectural effects, together with the most durable and satisfactory roof coverings to be had.

The original size of the English brick is $4\frac{1}{2} \times 9 \times 3$ ". The Roman brick $4\frac{1}{2} \times 12 \times 2$ ". These sizes have been modified for various reasons until we have brick of most all sizes and shapes imaginable, which is a great nuisance from an architect's standpoint, as no building of any architectural pretense can be properly designed without figuring dimensions which will be affected by a variation in size of the brick from the size used as a basis, and as it is often impossible to determine the exact brick to be used in a given building, in advance of preparing the plans, and sometimes

it is necessary to change to another even after the plans have been figured to conform to a particular brick, as there are hardly any two brick manufacturers in the country whose brick are of the same size, it make an endless amount of work and trouble for the architect and not infrequently the results are disappointing, with all the care possible short of actually preparing entire new plans.

Perfect uniformity of size would be of substantial value to all concerned. The exact size would not be of so much importance so long as the proper proportion of width to length was maintained, which should be, length equal to twice the width, plus one joint. Many brick are made the length equally only twice the width, not allowing for the joint, again where the length exceeds twice the width and a joint, in the once case leaving practically no joint and in the other a very large joint. Satisfactory results cannot be obtained with such sizes.

As to sizes of products other than brick, no definite or standard size can be fixed as this would naturally run into terra cotta and will in the very large majority of cases require special sizes.

The hollow blocks which have been made quite generally in this section of the country in the last few years can be used to advantage under certain conditions only. There are objections to them, which will limit their use, as for example their size makes it impossible to work even courses to given heights as well as lengths of wall, therefore requires the use of more or less brick in connection with them. This often makes their use ill-advised, as the only possible advantage over a wall entirely of brick, is the saving effected by their use. Where a large portion of brick is necessary to carry up jambs, reach proper height, etc., the saving is reduced to the minimum, if in fact a saving is effected at all.

Further objections are in the difficulty to keep the mortar from falling out of the head joints, owing to the thin shell. It is very difficult to apply the finish in buildings where they are used as the size of the blocks place the joints so far apart, it is often impossible to provide nailing at proper points, so that we naturally come back to the ordinary brick size, as being the most desirable for backing up walls, as well as for facing.

The units can hardly be larger than the standard brick size, especially in thickness, without encountering difficulties or providing special sizes, as it is absolutely necessary to govern the different heights to meet the requirements. With brick this is done by a variation in the mortar joints, with a brick $2\frac{1}{4}$ " in thickness the greatest variation possible, would be $\frac{1}{2}$ the thickness of a brick, or $1\frac{1}{8}$ " to be gained or lost, to come to the proper height of sill, top of openings, etc. While to double the size of the unit, making it $4\frac{1}{2}$ " instead of $2\frac{1}{4}$ ", we decrease the number of joints by half and increase the possible variation to overcome, by the same proportion, or to a possible $2\frac{1}{4}$ " to be taken care of, in half the number of joints, which would result in a great many cases in leaving no joints at all or in making very large and unsightly joints, if indeed it were possible to conform to the given height at all.

The introduction of the cement block has created a disturbance in the minds of the brick manufacturers to some extent. This need give little or no alarm, as the cement block, especially in its present form, is of short life.

The size prohibits its use in everything except the most ordinary class of work for the reasons just given. It is impossible to build a building of such large units, unless the building is planned with a view of making all of the openings, heights, etc., to conform exactly to these sizes, as the requirements of modern architecture will not permit a building to be planned and designed in this way. It would require special blocks of many different shapes and sizes for each individual building. This would necessarily increase the cost of the cement blocks to a prohibitive point, as they have nothing to recommend them save their cheapness, compared with other materials.

What is most needed in this section of the country, is a cheap, rough brick. The brick industry has been well developed along the lines of paving brick, which can be used in the construction of buildings to advantage only under certain conditions. The development of face brick has quite kept pace with the demand, but little or no attempt has been made to supply the great demand for a cheaper brick for filling in and backing up the walls, which constitutes a large portion of the walls of most buildings.

I believe that most every one in the building business, felt at the time of the introduction of the paving or shale brick that the acme of perfection had been reached in the manufacture of common, rough brick for building purposes, but experience of the last ten years has shown conclusively that this quality of brick can only be used to advantage in certain portions of a building, in foundations, piers, and bearings where loads are concentrated, these brick fill every requirement, but for the general use of filling and backing up walls, they have many objections.

In the first place they are much better and more expensive than necessary, which means a waste, in the construction of buildings, as their extra quality adds nothing to the value of the building, again they are in many ways a positive disadvantage, it being impossible to place the finish without plugging the walls and their vitreous character, which makes them so valuable for many purposes, is a positive disadvantage when used for filling and backing up of walls, as it greatly retards the drying out of the mortar and consequently of the plaster and eventually the drying out and preparing the building to receive the interior finishings.

They are not a desirable brick for the construction of chimneys, bricking in boilers, etc., as they are so dense they expand and contract to the extreme and are also great conductors of heat and cold. This same objection applies in the backing up of buildings to a certain extent, added to these objections is the one of their extreme weight, which requires more expensive foundations and footings.

The brick so generally used in and around Chicago, I have come to consider about the ideal rough brick. A few years ago these brick were used for filling and backing

the walls of a building in this city and at the same time we had charge of several other buildings in which the shale brick had been used. The Chicago brick were used in the one building purely on account of cheapness, but their advantages in point of weight, facilitating the drying out of the building, putting up finish, etc., left no question in my mind as to their desirability. It seems with all of the varieties and grades of clay to be found in this section of the country, we must have a clay or combination of clays that would produce a similar brick, and we know of nothing that would contribute more to the building up of our cities than the advantages of this grade of material and believe that with proper clay and other conditions would afford a profitable and desirable enterprise from a manufacturers' standpoint, as it would be an enterprise of practically one commodity.

The possibility of discovering just the proper clay to produce this grade of material, calls to mind a trip to the American Terra Cotta Works, located near Chicago, in about 1894 or 1895. My attention was called to the work of a young man recently graduated from the Ohio State University from the Ceramic Department.

Mr. Gates, President of the company, informed me that this young man was one of three of the first class to be graduated from this department. Knowing of this special course in the University, he had engaged one of the graduates before he finished his studies, built a laboratory at the works, and as soon as he was out of school, set him to work. At the time of my visit he had been at work only a comparatively short time, but had accomplished a great deal in taking care of shrinkage, tendency to warp, check, and other difficulties encountered in burning, also in producing colors and textural effects never before produced in this country.

Mr. Gates was very enthusiastic over his work, and speaking of this branch of higher education, expressed himself as of the opinion that it was a calling that should attract many young men.

I had forgotten the University, and thinking perhaps this would be of interest to the Clay Workers of Iowa, I wrote Mr. Gates for the name and address of the Professor in charge of this branch of the University. In his reply he states, "It is the Ceramic Department of the Ohio State University of Columbus, O., in charge of Prof. Edward Orton, Jr., whom I consider to be quite a wonderful man. Have sent four of my boys to him and only stopped then, because I had no more boys."

This, I believe, shows conclusively that what is most needed in the clay industries is greater knowledge and higher education along scientific lines, as I believe there can be no question that the products of clay will enter very largely into the construction of our future buildings, we must look for great developments in these products in the next few years, and I do not know of any profession or business that can be taken up by a young man with such prospects for financial success, so say nothing of the possibilities of great accomplishments.

Mr. Gates testifies to his confidence along these lines, when he sends his four sons to take up the same course. This action on his part confirms the idea that he is not only satisfied with the terra cotta business at this time, but he sees in its future development, room for his four sons and more if he had them. I believe many of those engaged in the manufacture of clay products in Iowa, could well give this suggestion careful consideration, coming as I believe it does, from one of the most successful men engaged in the manufacture of clay products in America.

STEAM DRYERS FOR BRICK WORKS.

A prominent New York State agent, when asked regarding the increased hazard in brick-yard plants from the installation of steam dryers, made the following comments:

"The largest and most progressive brick makers in the Hudson Valley and vicinity are building new plants or equipping old ones with steam dryers. Very little care seems to be taken to secure a safe installment of steam pipes. Whatever the layman may think, fire underwriters have good cause to insist that all steam pipes be hung on metal and not touch wood at any point. The old sun-drying brick yard is a simple hazard, kiln shed being separated from mixing and pressing sheds by a large yard, boiler houses usually away from other buildings, and built of brick. The new steam drying yards, on the contrary, are usually under one set of continuous roofs, are run throughout the year, full blast; have in the center the worst hazard of all—the long, overheated kilns—and are essentially a composite special hazard from an underwriting point of view.

"With a view to minimizing the increased hazard, the following suggestions as to construction are made in the expectation also that the rate of insurance will be modified to such an extent that the extra cost of construction will be saved in from two to three years by a manufacturer who adopts the methods. The matter, however, is not official, but individual, being the result of experiences with the brick making and other similar hazards.

"Suggestions as to dry kilns:

"1—Dry kilns to have brick side and end walls, each kiln divided by a brick wall from others, all walls adjoining other portions of plant to be at least three feet higher than same, without openings.

"2—Standard fire doors of wood covered with tin to be at each end of kilns, either rolling or sliding, but hardware must be absolutely standard as well as method of applying tin (see Underwriters' Association circular with cuts), and doors must overlap openings two inches all sides.

"3—Ceilings of kilns to be either (a) brick arched or (b) iron plates over-lapped and thick enough to support and be overlaid with at least four inches of clean sand; wood roof, if any, not to be embedded in sand, but anchored in brick above level of sand. Roof space to be clean and free from all piping and storage.

"4—Wooden ventilators to be (a) one for each kiln; (b) to be on brick bases which shall rise to at least four feet above the highest brick or frame wall within six feet of them; (c) to have no communication with roof space, if any, of kilns.

"5—Each ventilator and each kiln to have an open steam pipe with valve in easy reach and marked 'ventilator steam jet' and 'dry kiln steam jet,' respectively, and 'turn on in case of fire.'

"It will be seen that the specifications above require semi-fireproof kilns. This seems the best method owing to the practical impossibility of keeping steam pipes in the kilns from resting on wood or otherwise coming in contact with wood."

FIRE-BRICK WORKS FOR BOILER SETTING

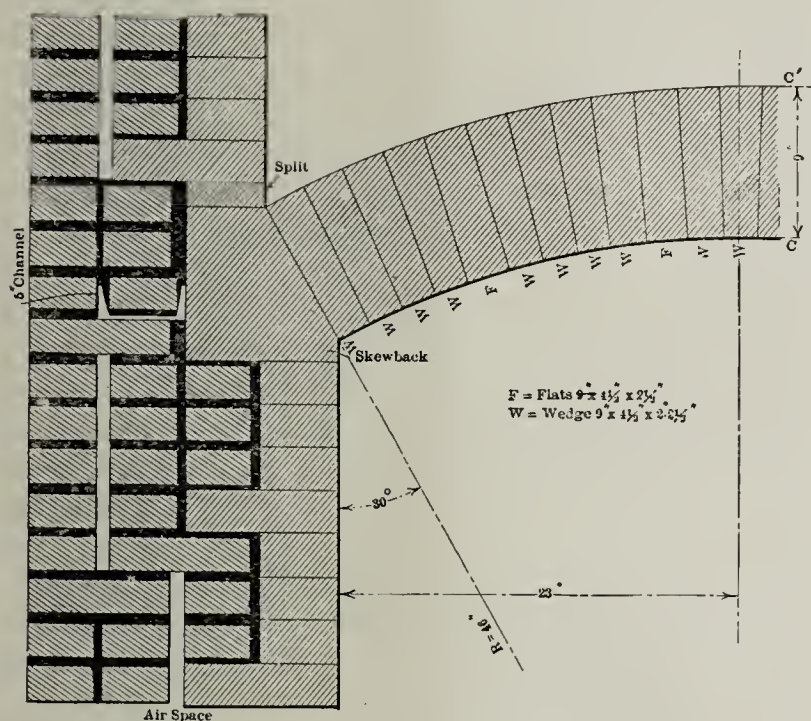
By R. P. King in American Machinist.

Fire bricks contract when heated. This should be borne in mind when designing arches and furnace walls, and when locating steel work that expands when heated.

The bricks need not be selected on account of hardness, although they must not soften under 3000 degrees F. Brick for arches must be selected with a view to absolute uniformity of size, contraction and fusing.

Uniformity is most important in a fire brick; a good second, uniform in size, hardness, contraction and fusibility is preferable to a first-quality brick that lacks these qualities.

When selecting brick for a boiler setting, the red brick for the backing should be selected with as much care as is given to the fire brick. They should be hard burned, swells and bumps not being objectionable unless the distortion prevents good laying; the appearance is of minor importance. The size of the red brick should conform to the size of the fire brick, so that header courses may be put in regularly as often as necessary; the courses should be so arranged that all headers be laid level.



Many writers say that for good work the clay should be the same as the bricks are made of. I do not believe that this is essential, my experience being that nearly any clay is good, provided it is finely ground. If a glaze is desired, a little common salt mixed with the clay will suffice to produce it.

In the illustration is shown a half arch and one arrangement of the skew back and side wall that support it. The skew backs for flat arches require attention, as upon their stability depends the strength of the arch. It is better to use specially moulded skew backs, of a form similar to those shown in the illustration. Back of the skew backs, well protected by the masonry, should be placed structural steel of suitable form to carry the thrust of the arch to the buck stays.

Taking the case illustrated, where the angle of the skew back is 30 degrees from the vertical, and the width of the

fire box 46 in., one-half the span or 23 in. divided by the sine of 30 deg. = 46 in., from which the circumference of the inner circle C equals 289 and of the outer circle C' 345.6 inches.

If wedge brick tapering from $2\frac{1}{2}$ to 2 in. are to be used, making up any deficiency in alinement with $2\frac{1}{2}$ -in. flats, then:

Let x = the number of wedge brick.

y = the number of flat brick.

Then $2\frac{1}{2}x + 2\frac{1}{2}y = 345.6$

and $2x + 2\frac{1}{2}y = 289$

from which $x = 113$ (nearly)

$y = 25$ (nearly)

The arch includes 60 deg. and we take $113 - 6$ for the number of wedge brick and $25 - 6$ for the flats. The results taken in even numbers give 108 wedge and 4 flats, as shown in the figure. Any problem involving arch, wedge or circular brick may be worked out in the same manner with results sufficiently close for practical purposes.

In estimating fire-brick work, it is not enough to calculate the number required; from 5 to 10 per cent. must be added.

BETTER CONDITIONS FOR THE POTTERS.

Dr. Horace G. Norton was one of the speakers at the seventh annual meeting of the American Association of Life Insurance Examining Surgeons, which was held in Boston. Dr. Norton spoke on "The Dangers of the Potter's Trade from a Life Insurance Viewpoint." He said in part:

"The special dangers of a potter's trade are due to dust, lead, ground flint, spar and exposure to extreme heat and cold.

"I think that in the light of modern research a greater part of the danger is due to the germ of consumption contaminating the dust.

"Trenton potteries are now as modern and complete in their equipments and as hygienic as potteries anywhere.

"I am unable to see any difference as regards the healthfulness of those employed in our potteries as compared to the workers in any other line of manufacturing in our city.

"One of the greatest blessings that has come to the potters in our city is the recent custom of having the potteries swept and dusted at night after labor has ceased. This very important innovation is due to the labor union, I understand, and certainly deserves great praise.

"Men should not be allowed to sweep or dust about their benches during working hours, nor should any employe be allowed to spit upon the floor under any circumstances.

"An abundance of spittoons—for example, one to every two benches—would be of the greatest benefit. These should also be washed and cleansed at night.

"Potteries should be heated by steam or hot water, not by hot air; exhaust fans should be so arranged as to ventilate the rooms and carry much of the dust out of the potteries.

"Much of the danger of groundlaying has been overcome by the introduction of machinery.

"I do not think we physicians in Trenton find much lead colic. Potters do not drink more than other workmen."

RECENT ENDURANCE TEST OF GAS PRODUCER.

Some skepticism having been expressed as to the claims made by the fuel-testing committee of the United States Geological Survey regarding the power-producing efficiency of coals used in the gas producer and gas engine, a so-called "endurance test" was recently undertaken by Prof. R. H. Fernald, who has charge of the Survey's gas producer plant at St. Louis. The results of this run, which began March 28 and continued until April 1, a period of 24 consecutive days, are particularly valuable and suggestive. They afford indisputable proof of the possibility of operating producer plants continuously for power purposes with the use of bituminous coals.

This test was made possible through the courtesy of Donk Brothers Coal and Coke Company of St. Louis, who generously supplied, without charge to the Government, 150 tons of screened coal from their mine "No. 3," located near Troy, Ill. The average of six analyses of this coal showed 14.68 per cent moisture, 30.98 per cent of volatile combustible, 42.93 per cent of fixed carbon, and 11.41 per cent of ash including 1.33 per cent of sulphur. The British thermal units per pound of dry coal were 12,343.

This test was made in the plant in which all the Government fuel tests have been conducted since October, 1904. This installation consists of a Taylor pressure producer gas plant of 250 horse-power capacity, furnished by R. D. Wood & Company of Philadelphia, and a vertical three-cylinder, single acting Westinghouse gas engine of 235 brake horse-power capacity, operating on producer gas. The engine is belted to a 175 kilowatt Westinghouse generator. The electrical energy developed during this test was dissipated through a water rheostat, designed to readily control the load upon the engine.

The coal was broken to about 3 inch egg size and delivered to the charging floor of the producer by a belt conveyor. It was charged to the producer at intervals varying from 25 to 30 minutes. The weight of each charge was 150 pounds. The hopper through which the coal passed to the producer is a double seal hopper with belt and cover plate. The producer was charged by hand. The bell is so designed that the coal is evenly distributed over all portions of the fuel bed, which was kept in uniform condition by hand poking from the top about every half hour.

The gas left the generator at an average temperature of 644 degrees F. and passed through a water seal dust collector and then to the scrubber. From there the gas passed directly to the centrifugal tar extractor which removed the greater portion of the tar left in the gas. It was then delivered directly to the holder. No further attempt was made to purify it, since experiments at this testing plant have proved conclusively that sulphur carried in the gas has no injurious effect upon the engine. From the holder the gas passed through a meter which has a capacity of 30,000 cubic feet per hour, on its way to the engine cylinders.

During this entire test calorimetric determinations of

the heat value of the gas were made every 20 minutes and volumetric analyses were made every 2 hours. The average heat value of the gas for the entire run was 156.1 British thermal units per cubic foot. This gas contained no hydrogen disulphide, 9.2 per cent carbon dioxide, no oxygen, .4 per cent ethylene, 20.9 per cent carbon monoxide, 15.6 per cent hydrogen, 1.9 per cent methane, and 52 per cent nitrogen.

Observations relating to the tar extracted during this test are of special significance, as it has often been stated that no plant which separates the tar mechanically could run more than 5 or 6 days without shutting down. The total tar extracted during this test amounted to 14,950 pounds, or about 143 pounds of tar for every ton of coal burned in the producer. This tar did not contain over 10 per cent of water.

As the plant was designed for general test purposes, the passages through which the gas was obliged to pass were far more tortuous than would have been the case in a plant installed merely for the production of power. In passing from the dust collector to the scrubber, the gas was forced to make 3 right angle turns and pass through a water seal valve, traversing a distance of about 20 feet instead of 3 feet, as would have been the case in an ideal arrangement. Owing to the deposit of tar in the water seal valve, the test was brought to a close after 24 days. Without this unfortunate combination of piping, more notable endurance records should be made than the surprising 24-day test here recorded.

The ashes were removed about once every 48 hours without shutting down the plant. This was accomplished by simply reducing the pressure under which the producer was operated and running the plant on the suction basis during the hour required for removing the ashes. The men worked with entire ease and comfort during this period.

The engine ran in perfect order at all times during the period of 24 days and at the end of the test was found in unimpeachable condition. Even a cleaning was not necessary. It is still operating with remarkable regularity and shows no ill effects from the strain to which it was subjected. The producer plant was also found in excellent condition, and the regular tests are now going on as usual.

Owing to the fact that final calibrations of some of the instruments used in this test have not been received, the official horse-power carried during the test and the dry coal required per brake horse-power cannot be given. The approximate figures show, however, that an average horse-power of 227 was used during the test, and an average of 1.39 pounds of dry coal consumed per brake horse-power per hour.

SWITCHES, FROGS, R. R. CROSSINGS.

The M. Mitshkun Co., of Detroit, Mich., whose advertisement will be found in our columns, manufacture and carry in stock for prompt shipment, Switches, Frogs, Railroad Crossings to fit any and all sections of rail, also Industrial turntables, portable track, tram cars, and all track connections. Write for Catalog "A."

SAY DETROIT CAN'T RUN BRICK PLANT.

The three judges who heard the suit brought by Attorney Charles Flowers, in the name of the attorney general, to restrain the city of Detroit, Mich., from spending the \$50,000 appropriated for a brick plant, have decided in favor of the petitioner. Judges Mandell and Murphy took the ground that the city had no right, expressed or implied, to enter into such an undertaking, while Judge Brooke held that it was not common sense to prevent the city from making its own paving material and to leave it at the mercy of contractors. In the majority opinion it was said:

"It is urged that if the power to pave streets be given by the charter, such provision necessarily carries with it by implication the power to prepare, furnish, or even manufacture the paving materials. But a paving brick is a well known and widely sold commercial commodity, and if the argument has force it might as well be asserted the city has by implication the power to manufacture everything that goes into paving."

After denying the city the right to operate a brick plant, the judges say: "We are further of the opinion that it is not one of the powers that is essential to the declared objects and purposes of the municipal corporation."

Judge Brooke takes exactly the opposite ground. He cites the fact that the city has for some time maintained an asphalt plant and a plant for cutting cedar posts into paving blocks, and while he admits that there may be no good reason for allowing the city to manufacture another kind of paving material, he says:

"Yet I do not believe the power to build, maintain and operate the plant in question should be denied to the city, which has indicated the economic necessity for such action through its properly constituted officers, unless it is clear beyond peradventure that the exercise of such power is unconstitutional. If the conclusion reached by my associates is correct, then even the legislature cannot, by grant of authority to the city, clothe it with power to do this act. This would mean that through all time the municipality would be at the mercy of private contractors in carrying on this most important branch of municipal activity, the repaving of its streets. The application for the injunction should be denied and the bill dismissed."

BRICK MEN GO FREE AGAIN.

"A conviction, based upon a bad indictment, is like a palatable breakfast based upon a bad egg," Judge Wanmaker said in passing upon the indictments of fourteen brick dealers who were held by the grand jury for being in a "trust."

For the second time the indictments were quashed for legal technicalities. Three months ago Judge Hayden, of Medina, quashed them for defects; this time Judge Wanmaker made the order to quash on the ground that the men indicted were not connected specifically in the indictments, with firms whose actions are said to have been violations of the Valentine anti-trust law.

The grand jury, which meets June 18, will correct the defects, however, and Prosecutor Hagelbarger hopes to place the men on trial before the present term of court ends.

FIRST UNIT OF AMERICAN REFRACTORIES CO. ABOUT READY TO START WORK.

When the American Refractories company starts manufacturing, July 1, at its plant at Rockdale, Joliet, Ill., will have the benefit of another large industry at its doors.

Brick for use in kilns, open-hearth furnaces and other places where high temperatures are used, is to be the product of the plant, and as soon as the remainder of the plant is completed about 600 men will be employed. But 150 will start work July 1.

Both because of peculiarities in its construction, and because of its product, the plant will be one of the most interesting about Joliet. There are to be four units, separate and independent of each other. One is now nearly complete.

The main building of this unit, as stated before, an independent factory by itself, is 238 feet long and 136 feet wide. In it are rock crushers, mills, mixers and hot floors. Supplementing this are the kilns.

The plant will have its own water supply from an artesian well and will use a stand pine of about 180,000 gallons capacity. A 250-horse-power boiler and engine of the latest model furnish the power for the plant.

The process of manufacture is interesting. Open-hearth furnaces and places where extreme heat is used require a brick which will not only withstand the heat, but will reflect it. After much experimenting, it was found that brick made from ganister, one of the hardest known rocks, gave the best results.

This rock is quarried near Baraboo, Wis. At the plant it is crushed, then powdered and mixed with enough lime solution to form a thick mud. Molded into brick, the soft brick are dried on a hot steel floor.

From this floor they go to the kilns, and are subjected to about 3,000 degrees of heat, coming out almost as hard as the original rock.

GETS FIFTY DOLLARS MONTHLY FOR FORTY YEARS.

Among the decisions handed down by the Superior Court at Pittsburg was one affirming the decision of Judge Francis J. Kooser in the case of Edith Lawrence King et al. against the Savage Fire Brick Company. This case, embracing as it did a number of intricate legal questions, has been in litigation for some years, and the decision of the Superior Court was awaited with considerable interest by the array of attorneys connected with it. It was a contest over the will of Georgia Edith Manning of Mississippi, who owned a lot of fire-clay land leased to the Savage Fire Brick Company at Williams' Station, and extended to Bedford county.

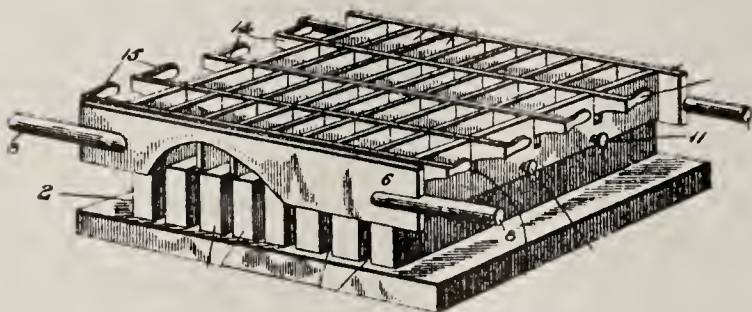
A portion of the estate of the testatrix was claimed by the children of Attorney Alexander King of Meyersdale, and this contention has been sustained by the decision of the higher court. Through this decision Mr. King's two children will receive a minimum rental of fifty dollars per month for forty years. Besides, there is considerable money that has been in the hands of a stakeholder for some years pending a decision from the courts.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

818,452. Mold for Bricks. James A. Judie, South Bend, Ind. Filed Aug. 3, 1905. Serial No. 272,606.

Claim. A mold for bricks comprising a slotted bed-plate, a partitioned mold-frame mounted on the bed-plate with the partitions thereof in the slots of the bed, and a combined ejector and carrier mounted in the mold-frame and dividing the latter into a plurality of matrices.



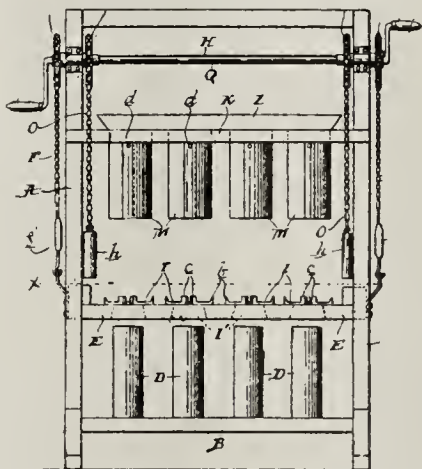
A brick-mold comprising a slotted bed-plate, a mold-frame supported on said bed-plate and having partitions adapted to fit in the slots of the bed-plate, said partitions being provided with rows of slots, and a plurality of combined ejectors and carriers each having an upright plate fitted in the slots of the partitions and also having blades arranged to rest on the top of the bed-plate and straddle the partitions, substantially as specified.

819,467. Composition for the Construction of Bricks. Edward R. Stowell, Portland, Ind. Filed April 18, 1904. Serial No. 203,763.

Claim. The herein-described brick composed of amorphous carborundum and Portland cement, substantially as described and for the purpose specified.

819,251. Cement-Tile Machine. Luke R. Peck, Caro, Mich., assignor of one-half to Charles O. Thomas, Caro, Mich. Filed Jan. 26, 1906. Serial No. 297,956.

Claim. In a cement-tile machine, the combination with one-piece inner and outer molds, of one-piece auxiliary outer molds formed of a pliable sheet of a material such as tar or roofing paper and provided upon opposite ends with fastening devices detachably connecting the ends of the



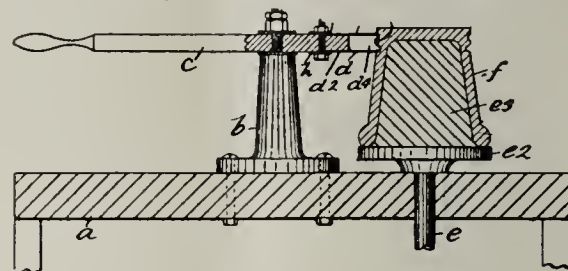
sheet together and forming it into an open-ended mold adapted to form a lining for the outer mold in casting the tile and an independent and removable outer support for the tile after casting it.

In a cement-tile machine, the combination with an inner mold, of an outer mold adapted to diametrically expand and contract at least for a portion of its length, and an auxiliary outer mold formed of a single sheet of pliable material with overlapping ends provided with fastening devices detachably securing the ends together, said auxiliary molds adapted to

form a non-adhesive lining for the outer mold in casting the tile and a removable independent outer support for the tile after the removal of the outer mold.

819,170. Device for Ornamenting Earthenware Articles. Frederick J. Ridgway, Joseph Aynsley, and Frederick Hancock, Stoke-upon-Trent, England. Filed Dec. 6, 1905.

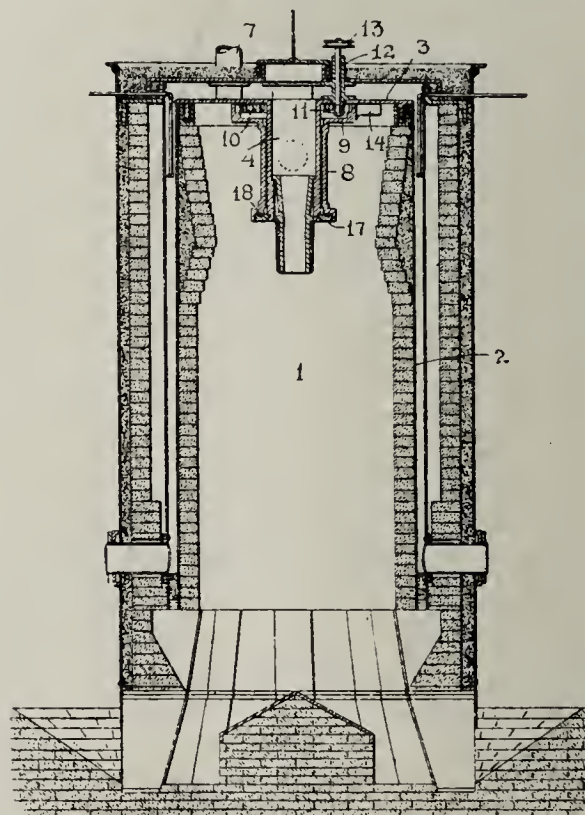
Claim. An apparatus of the class described, comprising a suitable support, a standard mounted thereon, an arm mounted on said standard and adapted to swing in a horizontal plane and provided at one end with a cutter, and a rotatable holder mounted on said support adjacent to said standard, substantially as shown and described.



An apparatus of the class described, comprising a frame, a rotatable support mounted thereon, an arm-support mounted adjacent to the rotatable support, and an arm pivotally mounted on said arm-support and adapted to swing in a horizontal plane, and provided with a cutter or former composed of sheet metal bent into yoke shape, substantially as shown and described.

819,075. Gas-Producer. Charles H. Morgan, Worcester, Mass. Filed June 3, 1904. Serial No. 210,960.

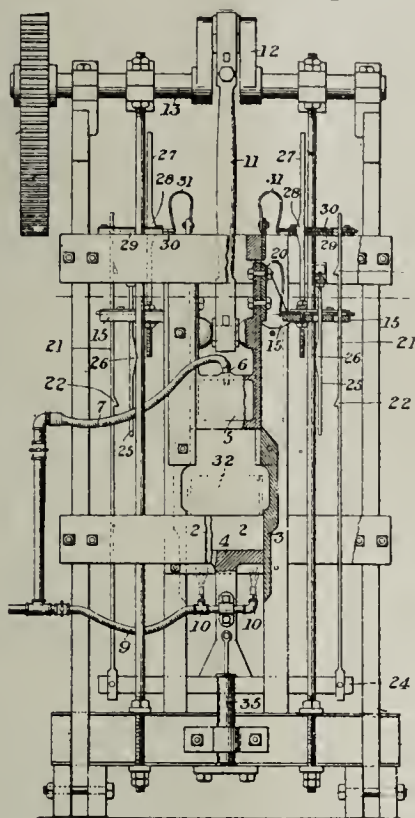
Claim. In a gas-producer, the combination with a gas-producing chamber, of a cover for said chamber, a rotating member journaled beneath said cover, an opening in said cover for the admission of fuel eccentric to the axis of said member, a scraping-blade projecting from the top of said rotating member, whereby the top of the fuel in said chamber is leveled.



In a gas-producer, the combination with a gas-producing chamber having an opening for the admission of coal, of a rotating sleeve journaled concentrically with the axis of the chamber, a tangential blade carried by said sleeve, a cup-shaped flange on said sleeve, having an internal gear, a pinion inclosed in said flange and engaging said gear, and means for rotating said pinion.

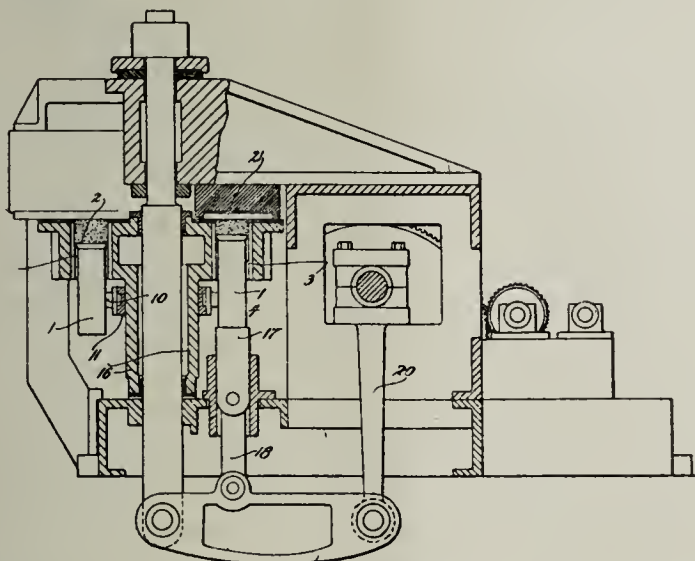
819,517. Molding-Press. George H. L. Clark, Sterrett township, Allegheny county, Pa. Filed Sept. 26, 1905.

Claim. In a press, a movable upper plunger, means for reciprocating the same, a movable mold-bottom, lifting-rods for the mold-bottom, locking devices arranged to periodically connect the movable bottom and plunger through the said



rods to move together to raise the mold-bottom to a point somewhat above the top level of the mold, means for then releasing such connection and allowing the mold-bottom to drop slightly, other locking means for temporarily holding the mold-bottom in such dropped position, and other releasing means for subsequently again releasing the mold-bottom; substantially as described.

819,781. Brick Molding and Pressing Machine. Henry G. Morris, Philadelphia, Pa. Filed Feb. 7, 1905. Serial No. 244,566.



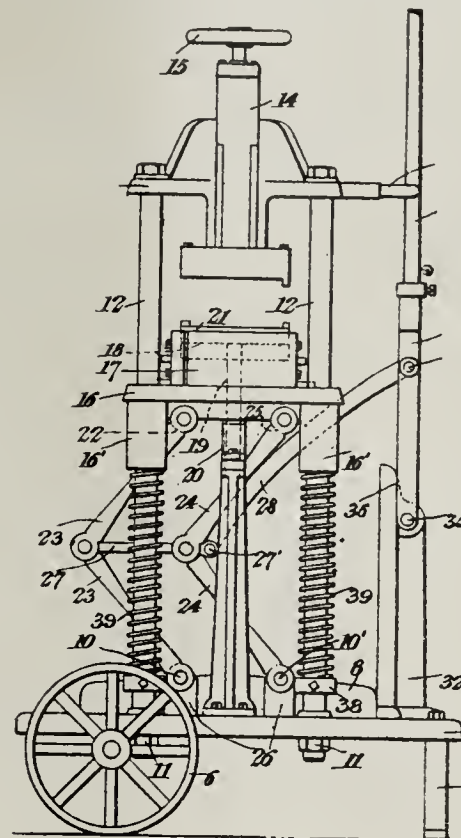
Claim. In a brick-making machine the combination of a table having an opening constituting a mold, a plunger having a top plate or part adapted to fit said opening and a reduced shank or body whereby space is afforded for the escape of material which passes the top part or plate, and a guide arranged internally of the plunger whereby it is protected from falling material, substantially as described.

In a brick-making machine the combination of a table having an opening constituting a mold, a plunger adapted to work in said opening and constituting a bottom for the mold,

an ejector arranged to lift the plunger, a cam, a follower engaging the cam and ejector, and an adjustable fulcrum for the follower whereby the upward ejecting throw of the plunger may be regulated, substantially as described.

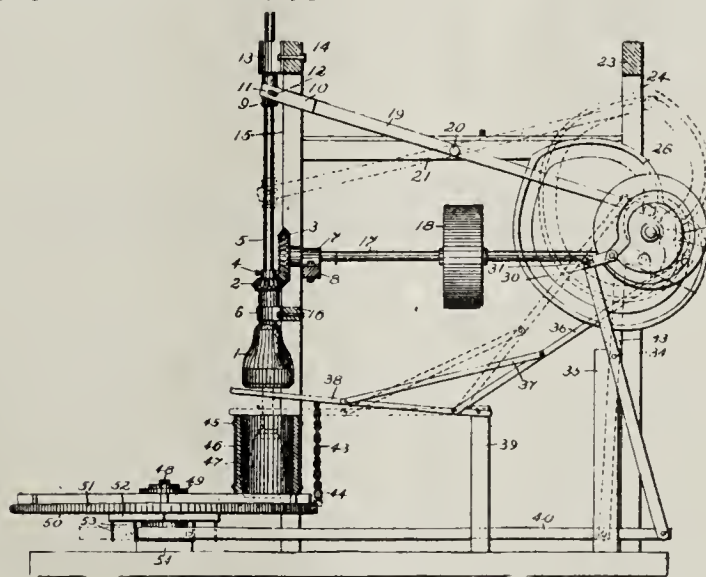
819,414. Press. John E. Donaldson, Frankfort, Ind. Filed Oct. 26, 1905. Serial No. 284,533.

Claim. In a machine of the class described, a base, guide-rods secured to the base, a die-carrying plate mounted for



vertical movement on the guide-rods, toggle-levers pivoted to the base and die-carrying plate, respectively, a pivoted operating-lever for actuating the toggle-levers to raise and lower the die-carrying plate, and a link connecting the toggle-levers and operating-lever and having one end thereof movable to a position below the pivotal center of the operating-lever when the latter is depressed for locking said lever in operative position.

819,931. Tile-Machine. John M. Schenk, Waterloo, and Joseph Schenk, Emmetsburg, Iowa; said Joseph Schenk assignor to John H. Stewart, Waterloo, Iowa. Filed July 1, 1905. Serial No. 267,950.



Claim. In a device of the type set forth a rotatable mold-carrier, a plunger, a pivoted element to engage the molds, and means for imparting a spiral and upward movement to said plunger and for raising said element when the plunger has been raised out of the mold.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the subscribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII.

JUNE 15, 1906.

No. 1

"I like to read American advertisements. They are in themselves literature, and I can gauge the prosperity of the country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the very time that advertising should be the heaviest. Ninety-nine out of every hundred merchants advertise most when there is least need of it, instead of looking upon advertising as the panacea for their business ills.—John Wanamaker.

A big head is often the result of a few small ideas.

Strength of mind and muscle can only be attained and preserved through use.

It's time to cross your fingers when you hear a man boasting of his good deeds.

The CLAY RECORD is the only semi-monthly clay journal in America. It costs only one dollar for 24 numbers.

Our idea of a hero is a man who does not hesitate to do his duty as he understands it, regardless of what other people say.

"Keeping everlastingly at it" bring success—but be sure you go at it in the right way. It isn't so much the doing as the manner of doing.

John Wanamaker of Philadelphia, who now spends one million dollars annually for advertising, commenced with a stock of goods valued at a little over one hundred dollars, and his next investment was sixty-five dollars for an advertisement in a daily paper.

We have had occasion, more than once, to say something on the practice of many communities or the Boards of Improvement acting for them, when materials of various kinds were required for various purposes, instead of buying them of local dealers or manufacturers, of purchasing in outside markets. If these materials were not obtainable at home there could not be any ground for criticising such methods, but in many cases that have come under our personal knowledge and observation, in purchasing brick for example, where as good material, if not better, could be had right at home, it is noted the purchases have been made elsewhere. One would be justified in thinking that local pride if nothing else, would control, and particularly where local prices were the same as outside figures and these purchases be made at home. But no! the opposite course is so frequently followed that purchasing at home is the exception and not the rule.

The ready questions comes up: why is this done? Why is such action permitted by the community? An analysis of several happenings of this character reveals that personal and political prejudices influence the majority of the members of the Board or Committee invested with the authority to make these purchases, and the local man or men are punished or rebuked, to put it mildly, for whatever it may have been which produced these prejudices. This being the fact, then why does the community permit it? "What is everybody's business is nobody's business." The community is quiescent, so to say, while the preliminaries are going on, and not until is all done is there any attention paid to what is done, when is too often, too late, besides to take action involves legal steps which are tedious and slow, and while it is being debated time slips by and the matter becomes ancient, or at least is so regarded when it is allowed to drop; not perhaps without some stir having been made meantime. And the final thing said is, "let it go this time, might as well, but it shall not be tolerated again." The result being, however, that the community falls back into its former state of mind, and the same offense before long is again committed.

The remedy for this, and the only remedy, in our opinion, is that rule or law the U. S. government enforces, in making purchases, only limiting the field of purchase to this country if the material be obtainable here, in the former case limiting purchases of materials to the community for which intended, if in it they are obtainable, price and quality considered.

Louis A. Wilson has brought suit for \$7,480 against the Los Angeles (Cal.) Pressed Brick Co., claiming that he was put to work in a pit that had previously caved in and that was dangerous. The second cave-in broke his leg and hurt his back.

OBITUARY.

Richard Graham, a well-known brick manufacturer of Lynn, Mass., died of heart failure. He was 58 years old and lived in Lynn 40 years. He leaves a wife and nine children.

George I. Wood, proprietor of the Wood Brick Works, Southbridge, Mass., was found dead by his wife. Despondency over ill health was the cause of his death. He was 45 years old and leaves a widow and two children.

Dr. Samuel P. Boardman, formerly president of the Springfield (Ill.) Pressed Brick Co. and the Lincoln Park Coal Co., committed suicide by drowning himself in the waterworks reservoir while mentally deranged as the result of protracted sickness.

W. J. Hemphill, late general manager of the Evans & Howard Fire Brick Company, St. Louis, Mo., died while on a visit at Jacksonville, Ill. He was 51 years old, a prominent railroad man and in 1897 retired from railroad service to enter the Evans & Howard Co.

ACCIDENTS, DAMAGES AND LOSSES.

The Toledo (O.) Cement Building Block Co. has had an involuntary bankruptcy petition filed against it.

H. T. Quick, while at work at the Orcutt Brick & Tile Works, Monroe, Ia., got his thumb caught in a machine and crushed off.

The Colonial Trust Co., of New York, has issued an execution for \$1,352,083 against the Nazareth (Pa.) Cement Co., and the plant has been seized by the sheriff.

Bert Goodwin, one of the proprietors of Goodwin's Brick works at Minonk, Ill., was seriously injured while trying to put a belt on a pulley, badly crushing his arm.

A receiver has been asked for the Arkansas Granite Brick Co., Ft. Smith, Ark., by the Topeka Steam Boiler Co. The plant was installed a year ago at a cost of \$30,000.

The New Era Cement Co., Nashville, Tenn., incorporated a year ago, and manufacturers of cement tile, has made an assignment. C. T. Benedict is secretary and treasurer of the company.

John Schramka, proprietor of a brick yard at Port Washington, Wis., was arrested by state factory inspector for employing two boys who were under age. He pleaded guilty and was fined.

Rosanna Prein, administratrix of her husband, has received a verdict of \$4,500 against the Cory Brick Co., Cohoes, N. Y., for the death of her husband, which resulted from a cave-in of the clay bank.

An order has been issued in the case of Daniel Webster against the St. Clair (Mich.) Brick & Tile Co., restraining the defendants from disposing of any stock of the company or encumbering the property.

The appointment of a receiver for the Walker Mining & Mfg. Co., Pierce, Stark Co., Ohio, is asked for by a minority stockholder. The company was capitalized at \$500,000 and owned property but never put up the plant. J. B. Weigel is president and Frank M. Levens, secretary and treasurer.

FIRE! FIRE!! FIRE!!!

The large buildings of the J. W. Ivery Brick Works at Dillsburg, Pa., were partly destroyed by fire.

The brick yard at Willoughby, O., owned by the National Fire Proofing Co., of Akron, O., was destroyed by fire.

The brick plant of C. E. Miller, East South St., York, Pa., was damaged by fire to the extent of several thousand dollars.

The power house of the Langenberg Brick Mfg. Co., near Whittlesey, Wis., has been destroyed by fire, causing a loss of \$3,000.

Fire broke out in the plant of the Norwood (Pa.) Brick Co., owned by Chas. T. Schuster, and damaged it to the extent of \$3,000.

The plant of the Squirrel Hill Brick Co., Bristol St., Hazelwood, Pittsburg, Pa., was damaged to the extent of several thousand dollars by fire.

Fire broke out in the extensive brick works of E. A. Poe, at Fayetteville, N. C., and caused a loss of \$10,000 before it was checked. Insurance \$2,000.

The large plant of the Hawthorne Pottery Co., Hawthorne, Clarion Co., Pa., was destroyed by fire causing a loss of \$1,800. The plant will be rebuilt at once.

The plant of the Krusel Fire Brick Co., located in Rochester, N. H., was entirely destroyed by fire, causing a \$15,000 loss. Insurance \$6,000. G. M. Goodwin and A. E. Atwell of Haverhill, and William E. Turner are the owners.

Fire destroyed the plant of the Jacksonville (Ill.) Brick Works, causing a loss of \$10,000, everything except the kilns being destroyed. Insurance was of a fair value. Edward C. Whitmer was the manager of the plant.

The plant of the Lake Superior Sand-Lime Brick Co. at Ripley, Mich., was destroyed by fire, causing a very large loss which is not estimated at this writing. The plant is one of the Huennekes system, and was rushed with orders.

Fire destroyed the plant of the Manitowoc (Wis.) Clay Products Co. The loss is estimated at \$20,000. Insurance adjusted at \$9,000. The plant will be rebuilt at once. G. W. Kennedy is treasurer and manager, Elmer Leach of Oshkosh, is the president.

**SAN FRANCISCO BUILDERS' ASSOCIATION
OFFERS INDUCEMENT TO SKILLED
LABOR.**

The Masons and Builders' Association, San Francisco, Calif., has raised the wages of bricklayers and helpers. Commencing May 21, bricklayers received \$7 per day, of eight hours, and helpers \$4 a day. This is an advance of \$1 a day for bricklayers and 50 cents for helpers.

In a statement that has been issued the Builders' Association declares the supply of this kind of skilled labor is inadequate to the demand and that it has been found necessary to take this action as an inducement to journeymen to come and help in rebuilding the city.

F. I. Hadley, Secretary of the Journeymen Bricklayers' Union, is of the opinion that there is enough bricklayers here to supply the demand existing, but many of them are temporarily engaged in repairing chimneys.

CLAY RECORD.

G. E. LUCE OPENS UP OFFICE.

Mr. G. E. Luce, for several years the mechanical engineer of the Illinois Brick Co., of this city, has opened up an office on the sixth floor of the Plymouth Building, Chicago. He will design and construct all kinds of clay-making plants, examine clay properties, test clays, correct faults with plants now in operation, and advise as to the possibilities of any plant. Mr. Luce is a man of varied experience. He has been connected with nearly every kind of a clay-making plant from that of common brick to that of the highest class of products. If you are looking for an engineer or are having trouble of any kind at your plant consult him.

BROWNWOOD TO HAVE THREE BRICK PLANTS.

Three new brickyards will soon be doing business at Brownwood, Texas. For a long time Brownwood has been without a brickyard, and until recently, it seems, it has not been discovered that the finest quality of brick can be made from clay found around here in great abundance.

Messrs. Taylor and Morton are installing a large plant to the west of town and will soon be ready to turn out the brick. Two other parties of Houston and Belton have leased ground and will install plants at once. Both claim to have fine beds of clay, and the sample of brick produced shows a very fine brick.

MR. ROSE OF SHARON IN THE EARTHQUAKE.

James V. Rose, Sharon, Pa., who has a large brick works in that city, and his wife, arrived home from San Francisco, where Mr. Rose is president of a brick and tile works. They were there during the entire time of the earthquake and were occupying quarters in the Colonial hotel at the time of the great disaster. They had narrow escapes, for the hotel was badly damaged, as it is in the heart of the stricken district. All their clothing was lost, and after a long and tedious walk through all kinds of dangers they finally reached the ferry and were fortunate enough to be able to reach Oakland. Mr. Rose says that the newspaper descriptions of the awful scenes in San Francisco are by no means exaggerated, and that they were so terrible that he cannot begin to tell of them. His company lost considerable by the quake, but he says that there is every indication that the city will be built up better and bigger than ever and that steel will enter very largely in all of the constructions. From Oakland they journeyed to Stockton and from there sent telegrams home apprising their friends of their safety.

COMPANY HAS SHIPPED 8,000,000 AND WILL DUPLICATE ORDER.

The Salt Lake (Utah) Brick company has shipped 8,000,000 brick so far to the Garfield smelters, and expects to ship 8,000,000 more before the order is completed. The brick is going out there at the rate of 60,000 to 100,000 per day. The company has been greatly hindered in the manufacture of fine pressed brick by the wet weather which has continued since February. But with the advent of more open and drier weather, the expectation is to catch up with orders in a short time.

COAL & IRON CO. WILL ERECT THREE PLANTS.

At the annual meeting of the stockholders of the Columbus and Hocking Coal and Iron company held recently, all of the old board and officers were re-elected as follows:

N. L. C. Kachelmacher, president; L. C. Lathrop, vice president; A. L. Thurman, secretary and treasurer. The above named gentlemen, with R. F. Little, T. P. Linn, C. G. Barratt, F. M. Cronise, C. M. Voorhees and H. O. Seixas, make up the board of directors. The executive committee is composed of Messrs. Kachelmacher, Lathrop, Little, Linn and Cronise.

The report for the past year shows a gain in results, compared with last year, of \$69,731.43, and proves that the company has made steady progress.

President Kachelmacher was tendered a vote of thanks for his able management of the company's affairs.

Near New Straitsville, Perry county, will be erected the first of the large brick plants which the Columbus and Hocking Coal and Iron company will build in the Hocking Valley. The site was selected last week and preparations for its erection will go forward at once.

Richardson and Lovejoy are the engineers in charge of the work, but Samuel S. Wyer of the Ohio State university has been selected as engineer in direct charge of the work, location of power plants, etc. Mr. Wyer will open his office with the coal company at once. The blue prints and specifications for the first plant, which will be of the stiff mud variety and will have a capacity of 150,000 brick a day, will be ready for inspection by contractors the last of this week.

This plant will be followed by two others, also of large capacity. The company has all financial details arranged and by next summer expects to have three immense brick plants at work in the Hocking valley.

LEHIGH SECURES SEWER PIPE PLANT.

Lehigh, Iowa, has beaten out the county seat in securing the Indiana sewer pipe concern that has been negotiating with both Lehigh and Fort Dodge over a location. A deal was closed at Lehigh this morning by which the Lehigh Brick and Tile Company, of which W. C. Beem was proprietor, was sold to J. A. Long, L. G. Holmes and Warren Overpack. Eighty acres of land are included.

The purchasers represent the Portland (Indiana) Sewer Pipe Company. They are a wealthy concern which for several months has been investigating the clay and other conditions at Lehigh and Fort Dodge with a view to establishing a plant for the manufacture of vitrified sewer pipe. They went to Lehigh first and afterward went to Ft. Dodge. After sampling the clay here a few weeks it was hoped they would find conditions satisfactory enough to locate here. Such is not the case, it seems, and the congratulations are due to Lehigh.

It is understood that the Lehigh clay has been tested in all manner of ways and they are sure the quality of sewer pipe will be of the best. The new comers expect to invest a large amount of capital in their Lehigh plant. They will employ about one hundred men when fairly under way.

POTTERY NEWS ITEMS.

John B. and G. Amphlett will start a flower-pot and jardiniere factory at Ionia, Mich.

J. C. Ham has bought land at Centerville, Ala., and will build an up-to-date swell pottery.

The plant of the Faience Pottery Co., Zanesville, O., was sold by the receiver to Chas. D. Wedge.

The Clay Products Co., Martha's Vineyard, Mass., is making extensive improvements to its plant.

R. A. Thompson, 318 Empire Bldg., Atlanta, Ga., proposes to establish a jug pottery at that place.

A settlement was effected with the potters at Crooksville, O., after a 7 weeks' layoff. Both sides won.

The Van Briggles Pottery Co., of Colorado, will build an addition 125x190 feet, and double the capacity of the plant.

Receiver Frank M. Rider, of the Progressive Pottery Co., Roseville, O., has had orders from the court to sell the property at private sale.

To avoid the duty it is stated that Trenton, N. J., pottery concerns will establish a large pottery at Ottawa, Canada. Dr. E. Coderdrick, of Trenton, is interested.

The plant of the New Castle (Pa.) Pottery Co., has been sold to East Liverpool capitalists for \$133,000. The plant was sold by a receiver to local men sometime ago.

It is estimated that \$8,000,000 is invested in the 29 pottery plants of Trenton, N. J., and that 4,289 persons are employed, whose annual wages aggregate \$3,000,000.

The J. H. Stroll Pottery Co., Cincinnati, O., has been incorporated with \$12,000 capital stock by L. J. George, J. H. Stroll, Martin Pothen, Gus Krug and A. R. S. Fangenberg.

The Mt. Gilead (O.) Tile & Pottery Co., has been incorporated with \$15,000 capital stock by J. C. McCormick, H. E. Hubbard, J. A. Wilhelm, J. R. Price and R. J. Pumphrey.

In our issue of April 30 we stated that "William Mason, formerly connected with the LaBelle Pottery at Wheeling, W. Va., has purchased controlling interest in the plant and will move to Wheeling and assume the management." This, we find from authority, is not correct.

ARCHITECTS WILL SPECIFY STONE ARCHES INSTEAD OF BRICK.

Hereafter Columbus, Ohio, architects will authorize stone window arches instead of brick. In other words, brick arches over doors and windows will not be built unless the owner specifically requests it. This step is taken owing to the fact that the Bricklayers' Union of America has attempted to prevent brick manufacturers from making cut brick for these arches, the union claiming that the brick should be cut by the workmen on the job. This would increase the cost of the arches from 100 to 300 per cent. As stone is cheaper, arches of this material will be used when possible.

SAND OR LIME BRICK OR BLOCK NEWS.

Crystal, Mich., has a cement brick plant.

L. P. Hutto, Kingman, Kansas, has started into the making of cement brick.

William Kuhaupt, Horicon, Wis., has commenced the manufacture of cement brick.

The Davis Cement Works, Davis, Ind. Terr., is now turning out 7,000 cement brick per day.

The Warren Sand-Lime Brick Co., Bainbridge, Ga., began making brick in West Bainbridge last week.

Wm. H. Cather, Center, Ala., wants information concerning the manufacture of sand-lime brick and blocks.

At the Paul Kleir Lumber Yard, Iola, Kansas, tests are being made of making brick out of smelter cinders and cement.

San Francisco, Cali., parties contemplate the erection of a sand-lime brick plant for making brick under the Steger system.

Thomas Hick's Brick Works at Dodgeville, Wis., is now turning out 3,000 brick daily, making them from cement, gravel and sand.

Full & Brooks, Ellendale, N. Dak., have bought a cement brick machine and are now preparing to make all kinds of plain and ornamental brick.

Maxfield & Forbes, of Finn Station, near Boulder, Colo., will put in a plant to make sand-lime brick. They are now burning lime at the above place.

The Pacific Coast Brick, Tile, Chemical & Cement Co., Seattle, Wash., has been incorporated with \$2,000,000 capital stock by R. H. Heath, A. C. McRae and S. W. Dally.

The Newark (N. J.) Cement Pressed Brick Co., has been incorporated with \$40,000 capital stock by John P. Lamb, Frank Craine, T. V. Rutledge, J. W. Rutledge and C. A. Stasel.

The officers of the Granite Brick Co., Glens Falls, N. Y., were elected as follows: President, Daniel P. DeLong; vice president, G. M. Ingalsbe; secretary and treasurer, A. Z. DeLong. The business for the past year was very prosperous.

Mr. Paul Tafel, who has been in Europe for the last 10 months in the interests of the Semisteel Co., of Cleveland, Ohio, has returned. He has acquainted himself with all the latest inventions and improvements in the equipment of sand-lime brick plants.

The Colorado Brick & Artificial Stone Co., Colorado Springs, Colo., will begin at once the construction of a \$25,000 addition to their plant. Bonds to the extent of \$35,000 have been issued for the purpose. Clark Mellon is president and Geo. W. Bierbauer, secretary.

Mr. H. F. Doyle, who was formerly the western representative of the H. Huenekes Co., has taken offices at No. 1147-1148 Marquette Bldg., Chicago, and he will represent the Standard Brick Machinery Company of 114 Liberty St., New York, in the west. The latter company is well known engineers and contractors for the erection of sand-lime brick factories.

MISCELLANEOUS ITEMS.

S. L. Bloom will establish a brick yard a mile north of Corona, Cal.

The C. H. Kline Brick Co., Chaska, Minn., are putting in 8 new kilns to their plant.

John Vick contemplates organizing a company for making 20,000 brick daily at Bryan, Texas.

The Thomas-Taylor Brick Co., Crystal Springs, Miss., made their first brick last week, the results being very satisfactory.

Pat McDonald has purchased the brick plant on Canyon Hill at Parma, Idaho, from John McMahan, and will greatly enlarge it.

The Harper Brick Co., of Kinkora and Harrison, N. J., has taken over the plant of the Milltown Enamel Brick Co., and will operate same.

The Harrisburg (Pa.) Clay Co. increased their capital stock from \$25,000 to \$50,000 for the purpose of acquiring more land and making improvements.

The Scanlon Brick Co., Crescent, N. Y., has been incorporated. City Attorney John Scanlon, P. M., Wm. B. Le Roy and George Whitney are the directors.

John Large, proprietor of the Brown City (Mich.) Brick & Tile Works, has bought the plant at Clifford, and will operate same. Archie McMillan is in charge.

The Matthew Owen Brick Yard at Blackinton, Mass., has been sold to Tillapaugh & Trudeau of Schenectady, N. Y., and will be put into shape and operated at once.

The Mohawk Valley Brick & Supply Co., Utica, N. Y., is a new company that will soon be putting brick on the market. The plant is on Schuyler Road north of West Utica.

The Claverack Brick Co., Troy, N. Y., has been incorporated with \$10,000 capital stock. Directors are: E. O. Ross and W. R. Hartman of Troy, and John J. Zimmerman of Watervliet.

The Mound City (Kan.) Brick Co. has commenced the building of a 100,000 capacity brick plant which will be finished by fall. O. A. Kentner of Coffeyville, is the head of the enterprise.

The Pacific Front & Ornamental Brick Co., Portland, Ore., has been incorporated with \$100,000 capital stock by F. H. Hilliker, Frank A. Sweeney, G. F. Archibald and James M. McNaughton.

At a recent stockholder's meeting of the Mayo Brick & Tile Co., Walhalla, N. Dak., \$10,000 was added to the working capital. A 6-mile switch track will be built into the yard by the Great Northern Ry.

A company has been formed at Moline, Kansas, to put in a brick plant and the R. D. Miller farm purchased. Those interested are John Cleveland, J. J. Webb, Geo. H. Turner, G. F. McKey, O. S. Stevens, H. R. Ellsworth, J. W. Farrow, E. A. Chaffin, L. D. Copeland, J. M. Johns, J. S. Ames, and J. S. Funston.

Phil Zeh will start a brick yard at Thief River Falls, Minn. He has found excellent clay.

The Morgan Brick Co., Norristown, Pa., has been incorporated with \$100,000 capital stock.

D. K. Cecil & Co., Ahsokic, N. C., contemplate the establishing of a brick plant with 30,000 brick capacity.

Edward Beyard and Wm. Patching, Gallup, N. Mex., are interested with Eastern parties in the building of a brick plant near that town.

The Keystone Pressed Brick Co., Bridgewater, Pa., will go ahead with their plans and build or complete the plant that was started a year ago.

M. Schmidt, Secor, Ill., is looking for a location to start a tile and brick plant. Mr. Schmidt is a well-known tile maker of splendid reputation.

The St. Elmo (St. Elmo Station, Chattanooga, Tenn.) Tile and Brick Co., has been organized with \$30,000 capital stock by W. A. Poe and others.

The People's Brick Corporation, Trenton, N. J., has been incorporated with \$100,000 capital stock by James L. Siple, Henry S. Bready and J. L. Conrad.

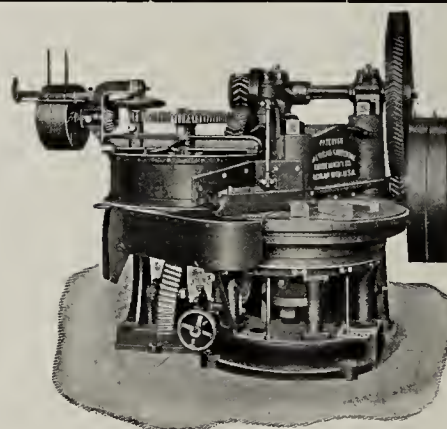
The Quincy (Wash.) Mfg. Co. has been incorporated to make brick. The officers are: M. F. Cochran, president, and A. J. Sallberg, secretary-treasurer.

The new plant of the Bingen (Pa.) Brick Co., on the North Penn Ry., has been started up, making 1,000,000 brick per month for the New York and Philadelphia markets.

The new quarter million dollar addition to the Kittanning (Pa.) Brick & Fire Clay Co.'s plant is now far enough completed that the manufacture of brick will be begun in a few days.

The Stegmayer Enamel Brick Co., New York, has been incorporated with \$200,000 capital stock. Directors are: H. C. Holmes, 1 Madison Ave., E. R. Hickel, and M. R. Hutchinson.

The Ennis-Crisp Brick Co. has been incorporated with \$30,000 to build a brick plant at Crisp, Texas. The sales office will be at Ennis. A. J. Mulligan is president; W. D. Farris, vice-president; J. Clark, secretary, and J. Baldrige, treasurer.



KOMNICK IMPROVED ROTARY PRESS.

install the complete plant and guarantee results, and are prepared to furnish complete or partial installation.

The American Sandstone Brick Machinery Co.

Saginaw, Mich.

One of these presses made 22M. brick each consecutive day of ten hours for more than six months without a breakdown. Another press made 4,235,000 the first ten months, ten hours per day run; is now making 35M. per day, day and night run. We were the first to introduce the Komnick or hydrated lime system in the United States; also to build and

The Two Rivers (Wis.) Brick Co. are now making brick in their new plant.

The Kelly Brick & Tile Co., Superior, Wis., has changed its location to Menomonie, Wis.

O. Duclos, Little Falls, Minn., has installed a 50 h. p. electric motor in his brick yard, to operate the plant.

Simon & Crawbuck Co., 15 Exchange Place, Jersey City, N. J., has been incorporated with \$50,000 capital stock, to make brick and building materials.

The Tulsa (Ind. T.) Red Fork Brick Plant and the Tulsa Vitrified Brick Co. have consolidated and E. B. Howard is president and general manager of the merger.

James C. Riley and Roscoe G. Heafer, Bloomington, Ill., have formed a partnership and are now engaged in starting a brick works on the old Holmes site, southeast of town.

The Barboursville (Ky.) Brick & Tile Co. have completed the installing of a 60,000 brick daily capacity plant. Dishman and McDermott control the stock of the company.

Three yards will be operated at De Pere, Wis., this season, those of John Roffers and Arnold Van Lanen, on the West Side, and John Hockers on the east side of the river.

The Coffeyville (Kansas) Vitrified Brick & Tile Co. are considering the establishing of another branch plant. This time at Vallejo, Cali., on the site of the old terra cotta works.

A. D. Baker of Deer Creek, Minn., and C. D. Baker of Fergus Falls, have bought the brick yard machinery at the later place and will move same to Deer Creek, where they will operate a yard.

The Fairfield (Ia.) Brick & Tile Co. has been incorporated with a paid-up capital of \$12,000 by Thos. Loudon, James Loudon, R. B. Loudon and J. C. Ward. The plant has already been built.

J. F. Bridge and Joseph B. Byles of Hancock, Md., Chas. A. Ritchey, Wiley Ritchey, H. N. Rosen, and F. W. Bridges of Hagerstown, Md., have organized a company for the manufacture of shale brick at Hancock.

The Weaver-Zeverly Construction Co., Morgantown, W. Va., has been incorporated with \$50,000 capital stock, to manufacture brick, etc. Incorporators are I. N. Weaver, H. J. Zeverly, Everett Casto, E. M. Zeverly and H. E. Casto.

BUILDING SUPPLIES WANTED

The wonderful progress of Northwest and Western
Canada has created a tremendous demand at

WINNIPEG

for all classes of Building Material. We reach every Architect, Builder, Contractor and Engineer in Northwestern and Western Canada. We reach every Brick Yard and Clay Worker. Write us for full particulars, etc.

\$1 a year keeps you posted.

WESTERN CANADA CONTRACTOR

720 Union Bank, WINNIPEG, CANADA.

A RARE OPPORTUNITY.

One thousand acres of "Fire Clay" with lignite coal in abundance on adjoining land. Clay of the following analysis with a vein running from four to forty feet. Some of it shows the same analysis, except has much less sand.

ANALYSIS:

Telephone Connection.

CHEMICAL LABORATORY,

H. ENDEMAN, PH. D.,

Analysis, Consultations and Researches.

23 William Street, New York, Aug. 9, 1904.

CERTIFICATE OF ANALYSIS.

For F. M. Greene, Atlanta, Texas.

I have examined the sample of Clay marked as stated below and find the following results:

It contains in 100 parts by weight—

Alumina	19.88	CLAY
Silica	20.95	
Hydrate water	6.03	
Oxide of iron	0.74	
Alkaline earths and alkalis	2.22	
Coarse sand (sample	35.00	SAND
Dust sand	15.18	

This clay situated in Texas. Would like to put it in as stock with good people to develop it. Samples and full particulars on application.

F. M. GREENE, ATLANTA, TEXAS.

C. M. Wilson, Sanderson, Texas, will soon have his first kiln ready for the market.

H. C. Eddins is reported to have established a pressed brick plant at Orange, Va.

J. H. Thomas, Turners Falls, Mass., has replaced the steam brick plant with power from the electric plant of the Turners Falls Co.

The first of the series of kilns to be erected by the Utica Pressed Brick Co. at Canastota, N. Y., is completed and filled to be burned.

The Yoke Vitrified Brick Co., Coffeyville, Kansas, has been incorporated. Capital stock, \$125,000. A. J. Yoke is president and manager.

The government has appropriated \$6,000 for the building of a brick plant at the Federal Penitentiary on McNeils Island, near Tacoma, Wash.

The Moline (Kansas) Brick Co. has been organized with \$25,000 capital stock. John Cleveland, president; E. A. Chaffin, secretary and treasurer.

The Dallas Brick & Tile Works, Dallas City, Ill., has been incorporated with \$2,500 capital stock, by Edwin Kieffer, Frank Kieffer and Rosa Kieffer.

J. H. Judik has purchased the Harman & Judik Brick Co.'s plant on Academy Ave., Baltimore, Md.; consideration, \$20,000, and has leased same to Bolt & Selter, who will continue the manufacture of brick.

The Penobscot Tile & Pottery Co. has been incorporated with \$48,000 capital stock, to manufacture terra cotta, brick and pottery. President Henry D. Black, Everett, Mass., Treasurer, Horace F. Hanson, Bangor, Maine.

The Summit (Miss.) Brick Mfg. Co. has been incorporated with \$25,000 capital stock. Officers: Dr. W. W. Moore, president; J. T. Covington, vice-president; W. A. Schilling, general manager; S. M. Covington, secretary; H. T. Gracey, treasurer.

The Menteno (Ill.) Brick & Tile Co., with \$100,000 capital stock, are now ready to do business. The officers are: D. G. Lee, president; George Hatch, vice-president; George Jackson, secretary; Otto Weber, treasurer, and John P. Hatch, general superintendent. Mr. Hatch is a Chicago brick maker of splendid reputation.

CLAY RECORD.

POSITION WANTED

Position wanted manager or superintendent of a first-class brick plant, any kind of brick or hollow ware. Can construct and equip any kind of plant, and take complete charge if necessary.

G, care Clay Record.

POTTERY FOR SALE

A two kiln pottery for sale in Philadelphia, Pa. conveniently located to P. R. R. Co., to P. & R. Ry. Co. and to Wharves. In running condition for the manufacture of any line of pottery ware. Kilns 16½ feet, up draft, with decorating kiln, all as good as new. Address
2539 E. Clearfield St., Philadelphia, Pa.

WANTED

A practical man with from five to ten thousand dollars to use in promoting a number one pressed brick plant in a hustling town, and afterwards to take charge of plant. Must be a practical pressed brick man.

Promoter care Clay Record
Chicago, Ill.

FOR SALE

Two Sturtevant Fans, Pipes and Fixtures for waste heat drying.
One Steam Pump.
Eighty (80) Double Decked Dryer Cars. Address
Shupe & Barnhart Shale Co.
Wooster, Ohio.

WANTED TO NEGOTIATE.

The undersigned owns 60 acres of land immediately upon the the Great Texas & Pacific Railway, west of Fort Worth, Texas, 47 miles, and 79 from Dallas, Texas, upon which there is a mountain of 20 acres of as fine brick and tile shale as can be found anywhere. Thickness of shale 40 feet above ground of valley surface, and thicker still below. Makes a cherry red brick. Wish to have a strong company formed and will take stock. Convenient to coal and water. Fine sale for product. Invite correspondence.
E. W. MORTEN.
Farmersville, Texas.

FOR SALE.

An interest in my tile and brick plant, to one of experience, that can take charge and run it. Must be able to invest some money in plant. Plenty of good clay at back door, and good market at front door. This is an opportunity that you don't often run up against. Plant now running. Come and see or write

S. H. RECORD,
Charleston, Ill.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address
T, care Clay Record,
Chicago, Ill.

FOR SALE.

Chambers End Cut Brick Machine, capacity 3,500 brick daily. 75 double deck roller bearing stiff mud brick cars.

STEELTON & HARRISBURG BRICK CO.
Steelton, Pa.

Buy a snap!
Right between best markets
In Minnesota
Cash or time.
Kilns and everything goes.

Yes, we are going to sell.
A fine location.
Right prices
Dead sure money maker.

Write RUSH CITY BRICK CO., Rush City, Minn

FOR SALE CHEAP.

First-class Brick Plant, or will contract with good party to make brick by the thousand, or will lease yard on royalty. 45,000 capacity daily. Ready sale at \$5.50 per thousand, F. O. B. cars at yard. Reason for selling, owner is contractor. Address
J. C. H., care Clay Record.

FOR SALE CHEAP.

One Atlas Engine, 35 horsepower. One Atlas Boiler, 50 horsepower. One Hercules, Sr., No. 108 Brick Machine. On Sander. One Turn-table. One 20 barrel Galvanized Iron Tank for washing moulds. One 4-spring Truck. Three Hand Wheelbarrows. Six Brick Wheelbarrows. One Disintegrator, Belting, Shafting, Pulleys. 85 Brick Moulds. 44 Iron Kiln Doors. 175 Kiln Grates. All of this property is nearly new and will be sold at a great sacrifice. For further information, write to A. J. WARD,
Holland, Mich.

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address
"GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.

THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new. DEALER,
Care Clay Record, Chicago, Ill.

MACHINERY WANTED.

Second-hand 9-foot dry pan, screens, elevators, pug mill, large size Chambers' brick machine, belting, pulleys, cable and dump cars. Also 150 to 250 h. p. Corliss engine, and two 100 h. p. boilers.
J. O. C., care Clay Record, Chicago.

FOR SALE.

A brick and Tile plant, equipped with up-to-date machinery, 60,000 daily capacity, down draft kilns, inexhaustible bed of best clay suitable for all kinds of building, facing and paving brick, drain, tile, sewer pipe, etc., on two railroads, demand very good. Address
B, care of Clay Record.

FOR SALE.

A going, money-making hollow block plant. Best location in Ohio. Also well equipped for face, common, paving and common brick. Includes coal mine and 125 acres of four foot Cambridge coal, overlaid with shale and underlaid with fire clay. Good prices and more orders than can be filled. Plant comparatively new and in excellent condition. Will be sold at \$40,000, two-thirds original cost, one-half cash and one-half credit. Good reason for selling. Address
THE GUERNSEY BRICK & CONSTRUCTION CO.
Cambridge, Ohio.

BRICK YARD FOR SALE.

Will sell half interest in buff and fire brick plant, to experienced man who can manage it. Address
CHAS. A. MYERS, Ft. Worth, Texas

BRICK YARD FOR SALE

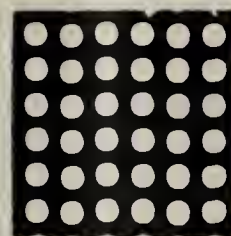
Brick Yard for sale, cheap, or to lease on shares. Write for particulars to R. N. BOAK
Middletown, N. Y.

FOR SALE OR TRADE.

One Standard Brick Machine, steam power, 30,000 capacity. 24 new Brick Moulds. 11,000 Pallets. Three Off-Bearing Trucks. All in first-class condition. Owner, E. J. SWARTZ & SON,
Syracuse, Ind.

FOR SALE.

One Model "B" Four-Mould Dry Press, used only a short time, thoroughly overhauled.
Model B, care Clay Record, Chicago.



PERFORATED METALS

for all purposes
Prompt shipment of all orders guaranteed.

H. S. SIMPSON,
817 Chamber of Commerce
Chicago, Ill.



Paper Joggers quoted.

R. A. HART, 41 White St.

No better made, cut from \$3 and \$10, to

4 Wheel, \$3.00

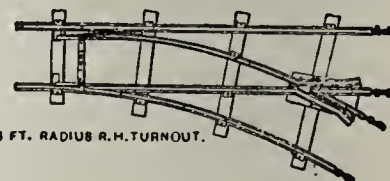
5 Wheel, \$3.25

Guaranteed.

Sold by all dealers

BATTLE CREEK, MICH

SWITCHES AND FROGS



18 FT. RADIUS R.H. TURNOUT.

Right and left-hand one, two and three way switches, of various gauges, radius and weight of rail, at special prices.

M. MITSHKUN, Detroit, Mich.

PARTNER WANTED.

A good, reliable man of experience, with some capital to invest in and take charge of a new Dry Press Brick Plant. Plenty of shale, and good market for all the brick. Address

DENIS, care Clay Record,
Chicago, Ill.

FIRE CLAY LANDS.

500 acres underlaid with heavy vein superior fire clay and light vein coal, which can be mined cheaply, on the line of the N. Y. C. & H. R. R. R., in Pennsylvania, for lease on royalty at low price per ton. For further information address the owner.
BOX No. 308, Williamsport, Pa.

FOR SALE OR EXCHANGE.

One of the best small brick and tile plants in Southern Michigan. 20,000 capacity, Stewart patent kilns, good drying sheds, all machinery in first-class condition, fine clay, good market. Will sell at a bargain or will exchange for good real estate.
Address,
MICHIGAN,

Care Clay Record, Chicago

STEAM SHOVEL FOR SALE.

Barnhart style "B," good condition, large enough to dig clay for 160,000 brick in 8 hours. Apply to
ILLINOIS BRICK COMPANY,
918 Chamber of Commerce,
Chicago.

FOR SALE.

One 5-ft. Style American Dry Pan, practically new. One 10-hp. Gasoline Engine, complete.
KIAMENSI CLAY CO.
Newport, Del

BRICK PLANT WANTED

Wanted to buy or lease a brick yard for making red brick.

RED BRICK
169 Division Street, New Haven, Ct.

SAND LIME PLANT.

Hueneke's System Plant, including best Four-Mould Boyd Press. Jeffrey Sand Dryer and Conveyor; all practically new and in good condition; will be sold at less than half of construction cost. Address, SAGINAW PRESSED BRICK CO.
Saginaw, Mich.

FRANK TOOMEY

127 and 131 North Third Street.
PHILADELPHIA, PA.

Great
Assortment,
3,200
Pieces.
ENGINES,
CORLISS.
Automatic,
Steam
Slide Valve,
Pumps,
Dynamos,
General
Machinery of
all kinds
Rebuilt and
Guaranteed.
Immediate
Delivery.
Send for
List of Stock

Brick and Mortar Coloring

After twenty years "Clinton" colors still stand at the head. Get the genuine, with the "Little Yellow Side-Label."

CLINTON METALLIC PAINT CO., Clinton, N. Y.
CORRESPONDENCE SOLICITED.

WARNING

NOTICE is hereby given that the process of drying and burning brick by first setting green, undried brick in horizontal courses in a kiln to form a layer thereof, then covering and drying such layer, and successively coursing, capping and drying separate layers of green, undried brick upon the last dried layer until all the layers are thoroughly dried, and then burning, is patented in U. S. Letter Patent No. 485199 to J. C. Kenzel, dated Nov. 1, 1892, and all persons are hereby warned against using such processes without grant or license from the undersigned owners of said patent. Unauthorized use of the patented process will render the user liable to an action for infringement and the payment of damages to the owners of the patent, whose rights thereunder will be strictly enforced.

J. C. KENZEL,
J. S. KRAUSS,

P. O. Box 271.

128 Logan St., Knoxville, Tenn.

The Burlington Route

calls attention to manufacturers seeking a new location to its Industrial Department. This department is established for the benefit of manufacturers. Information on the three Rs of manufacturing—Power, Raw Material, Market—can be had by writing



W. H. MANSS,

Industrial Commissioner,

209 Adams St., CHICAGO.

CLAY RECORD IS A SEMI-MONTHLY

NOW READY—A TREATISE ON

PRODUCER-GAS and GAS-PRODUCERS

BY AN ACKNOWLEDGED AUTHORITY.

A 300-page book containing thirty chapters, giving the fundamental principles and definitions, calculations, classifications, manufacture and use; the fuel, the requirements, the history, its by-products, **Producer-Gas for firing kilns, steam boilers, and power plants.** The future of the Gas-producer and a bibliography.

OVER 100 CHOICE ILLUSTRATIONS—PRICE, \$4.00.

A subscription to the CLAY RECORD for one year without additional charge to those that are not now subscribers.

CLAY RECORD PUBLISHING COMPANY

CHICAGO, ILL.

Refractory Cement

(So called because it is worked the same as cement)

A high refractory composition that can be used the same as cement, cured and put to use in twelve to twenty-four hours, and will endure any degree of heat that fire-clay products will.

Applied to the inside of a kiln it will protect the walls and give increased refractivity; will reduce the cost of repair, and save fuel in any kiln.

Every boiler furnace should be lined inside with "Refractory Concrete." It will protect the walls and increase the heating capacity by preventing radiation.

For insulating steam pipes this composition is guaranteed equal to asbestos or magnesia felt; the cost per foot to cover a 3-inch to the thickness of 1 inch will be 4c.

Refractory brick of a high order can be formed from the composition on any cement brick machine.

For flue linings, chimney blocks and tops, floor and partition blocks, conduits for electric wires, etc., this is the ideal material.

Refractory Concrete can be combined with any aggregate used in the formation of cement products.

For information pertaining to your particular requirement, and prices, address.

E. R. STOWELL

NEW CORYDON, INDIANA

**A NEW CLAY FEEDER AND MIXER**

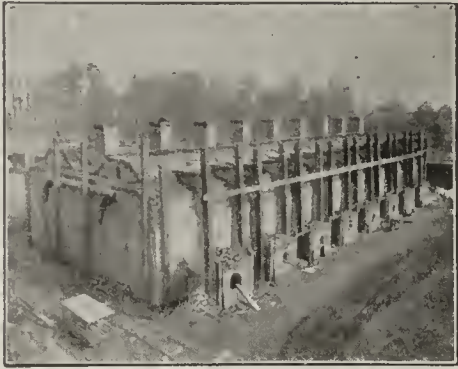
The Rust Clay Feeder has been brought out in response to a better method for mixing and feeding clay in brick, tile and all clay working plants. By the use of this feeder the services of two men are entirely dispensed with, the clay being dumped into hopper of machine from car is automatically fed into the disintegrator. The spirals draw their supply evenly from all parts of the hopper, mixing the clay perfectly, which tends both to improve and increase the output of the plant.

Send for full descriptive circular

Marion Machine, Foundry and Supply Co.

Marion, Ind.

Something New In Brick Kilns and Dryers



The Dennis Double Chamber Up and Down Draft Brick Kilns and Direct Heat and Hot Air Brick Dryers show many new features that make them superior to all others. Economical, durable and strong in construction and operation, having many points of advantage that appeal to practical brick-makers. Patented April 14, 1903 and September 8, 1908. Brick plants installed and put in operation. Write for booklet. Correspondence solicited.

F. W. DENNIS,
145 Water St., Norfolk, Va.

Absolutely safe and reliable. Ask your friends

A WOODEN TOWER

Is a source of annoyance and danger. It is liable to rot and collapse at any time. A

CALDWELL STEEL TOWER

is safe, staunch and durable and will carry four times the weight of the filled tank. Expensive labor is not necessary to erect these outfits, your own men can do it. We furnish all plans.

Send for illustrated catalogue and price list.

W. E. CALDWELL CO., Louisville, Ky.

Robert F. Wentz, M. W. S. E.

701 National Bank Building, Allentown, Pa.

DESIGNER AND BUILDER OF

Cement and Sand-Lime Brick Plants, Analysis, Tests, Examinations, Reports, Preliminary Plans, Estimates and Complete Drawings and Specifications for Modern Cement and Sand-Lime Brick Works.

We have designed, built and reconstructed twenty-two Cement Plants in the past twenty years.

We design and equip complete Cement and Sand-Lime Brick Plants with the most modern machinery.

THE HYDRO - MALAXATOR PROCESS for the manufacture of Sand-Lime Brick.

How to Use Portland Cement.

From the German of L. Golinelli.

Translated by Spencer B. Newberry, E. M., Ph. D.

A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.

22,000 copies sold in Germany.

Portland Cement Sidewalk Construction.

Compiled by P. B. Beery, and based upon the experience of many successful contractors.

A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.



FIRE! FIRE!! FIRE!!!

THE "CHILDS"
FIRE EXTINGUISHERS
APPROVED

and included in the list of approved extinguishers issued by the

National Fire Protection Association

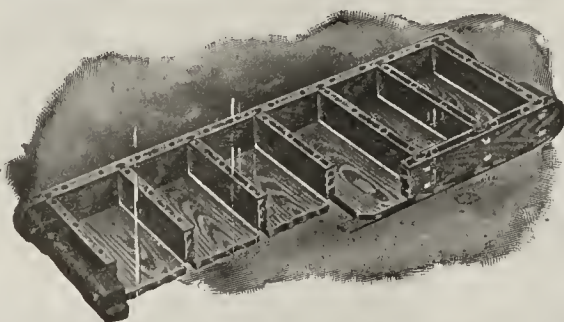
SALESMEN WANTED

O. J. CHILDS CO.

Sole Mfrs.

UTICA, N. Y.

PERFECTION BRICK MOULDS



PATENTED JAN. 23, 1902.

THE ARNOLD-GREAGER CO.

Manufacturers of Brick Machinery
and Supplies of all Kinds.

NEW LONDON, OHIO.

These are the kind of Brick Moulds the Brick Makers have always wanted but could not get till now. You can get a mould that the vents are right all the time. No change whether the Mould is wet or dry. Try a sample order. Satisfaction guaranteed.

Brick Moulds and Brick Barrows

With Moulds and Barrows it is not the first cost, but it is, will they last? We have made them for over 30 years and know your wants. All kinds and shapes. A trial order will convince.

James B. Crowell & Son,
Wallkill, N. Y.

H. M. DEAVITT,

PRACTICAL AND CONSULTING CHEMIST,
Garden City Block,
CHICAGO.

Analyses of Clay, Sand, Lime, Cement Materials and Shales a specialty.

Special attention given to the preparation of Clay Products from the raw material.

A well equipped laboratory and long experience in this branch of work enables us to give expert reports on obtaining glazes on refractory materials.

All enquiries in regard to the above will receive prompt attention.



Vol. XXVIII. No. 12.

CHICAGO, JUNE 30, 1906.

Semi-Monthly, \$1.00 per Year
Single Copies, - 10 Cents

BIOGRAPHY OF CLAYS.*

By Ross C. Purdy, Champaign, Ill.†

The history of a particular deposit of clay or a citation of all of the agencies that have affected its chemical and physical character, is almost an impossibility. Many theories and speculations have been entertained by scientists, all of which may come to naught by the discoveries of new facts. Our sciences being still in the formative stages; revolutions and evolutions in the field of pure science are still with us; yet there are known facts concerning nature and there is convincing circumstantial evidence from which deductions can be drawn that have every earmark of being true when viewed in the lime light of our highly developed sciences. The great difficulty in studying the agencies and their effect on the rocks, clays and soils, is that we can not observe accurately the processes as they are operating. But as Seger says, "Even if nature does not grant to the human eye a look into her most secret work-shops, if she does not show how she changes clay into shale, sand into sandstone, or wacke, or forms a crystalline lime or marble out of the deposit of calcareous shells, if she has not yet, up to this time, permitted us to determine the conditions under which, in heaps of detritus formed by friction and weathering, the like constituents move to certain centers of concentration and become new crystalline formations, speculative science, by comparison of the products upon which these unknown influences have worked for an unlike duration of time, or with unequal intensity, yet furnishes a hold as to how these may have originated and bring us closer to the workshop of nature, for the most part not accessible for direct observation."

One of the greatest factors making difficult the study of the efficiency of forces operating in nature, is time. In the laboratory, the longest duration of time in which observations of the physical and chemical changes taking place when substances are undergoing changes is an almost "infinitely small fraction of the time through which the forces or agents have been at work." To illustrate, Van Hise says that "in the chemical laboratory, the amount of crystalline silica which can be dissolved in water and transported to another place within the time during which an ordinary experiment is carried on, is so small as to be immeasurable, and yet it is certain that in nature, water has dissolved and transported to other places enormous quantities of silica."

However, there are known agencies at work in nature, with cause and effect of which we are, in the main, familiar. We know something of the factors that tend to shape the character, disposition and capacity of a human being, but the problem that is the more difficult is to study a human being and determine what forces have made him what he is. In an analogous way, the same can be said of clays. While we can enumerate the several factors causing alterations and modifications in the chemical and physical properties of a clay, it is not so simple a matter to study the physical and chemical properties and then determine the factors which have affected these properties; so let me repeat the introductory sentence; the history of a particular deposit of clay or a citation of all the agencies that have affected its chemical and physical character is almost an impossibility.

FORCES AT WORK.

Wind, water, ice, and changes of temperature: These agents are so effectual and operate within such a limited space of time that they can be observed and measured with a tolerable degree of accuracy. They are too well known to warrant extensive elaboration at this time. Animal life from the earth worm to the large burrowing animals throughout all parts of the earth is constantly working over the soil, assisting, as it were, the work of the elements, water, wind and ice, and the changes of temperature. Vegetation, from the mosses to the trees, affect very materially the opportunities for running waters, blowing winds, moving ice and changing temperatures to carry on their work of alteration by promoting, transporting and exposing new surfaces. Denuding of forests, sinking of artesian wells, cultivation and drainage of soils, changing of water courses and opening of canals all play their part in influencing this work. The transportation, denudation and deposition of materials by which water and ice and their consequent effects will be touched upon latter, when considering the types of clays as we find them in nature.

Chemical Agencies: The abstraction of inorganic materials from the soils by plant life is an important factor. The materials most abundantly abstracted, according to S. W. Johnson, are potash, soda, magnesia, lime, phosphoric acid and silica.

In grain and straw, Johnson found the following:

	Grain.	Straw.
Potash	18.50	12.0
Soda	3.90	4.6
Magnesia	7.00	3.0

*Read at the 1906 meeting of the National Brick Manufacturers' Association.
†Instructor in Ceramics at University of Illinois.

Lime	2.70	7.3
Phosphoric Acid	32.40	6.0
Silica	31.10	59.7

Johnson further affirms that plant life is capable of disintegrating feldspar, converting it into clay and the carbonate of potash. It is even stated that plant life frequently cuts great furrows in the more soluble rocks, such as limestone, by virtue of the acid reactions at point of contact of the roots with the rocks.

F. H. Storer has proven by experiments that owing to the chemical action of plant life, the soil and clay is made more soluble.

Action of bacteria in clays has received considerable attention from the potters and justly so, for they play an important part in the oxidation process of vegetable rot in clays. They are the main organic agents in the process of oxidation of dead plants and animals. Oxidation by water and oxygen alone, it is claimed by Van Hise, would be very slow were it not for bacteria. They accelerate the oxidation of carbon and with the aid of water, convert it into carbonic acid; they act upon the plants converting their nitrogen into nitrous and nitric acids and ammonia; the effects of which will be considered later. In fact, bacteria are potent in the oxidation and reduction processes that so alter the admixed ingredients of our clays that they deserve the prominent consideration they are receiving in our scientific researches on clay.

Excreta of animals consists in a large part of chemical compounds that promote chemical changes. The passage of soil through the alimentary canal of an earth worm, decomposing the material matter is a factor too little appreciated.

Humic acid plays an important part in the chemical changes occurring daily within our soils. Humus is the end result of the action of bacteria; water and oxygen on organic compounds. The main effect of humic acid is to convert silicates into carbonates and by its own breaking down, producing carbon dioxide. It has also the property of holding water heat, ammonia, acids and soluble compounds, all of which promote chemical activity.

Richard Mueller, an eminent German chemist, experimented on the effect of carbonic acid on the various silicates and succeeded in showing that almost all of the silicate minerals were susceptible to the destructive action of carbonic acid. In the process of carbonation, sodium, potassium, calcium, magnesium, and iron that were originally combined as insoluble silicates, were converted into the soluble carbonate compounds, and the alumina made soluble, and the silica partly soluble. The alkaline carbonates thus formed are able, in turn, to decompose other silicates under ordinary conditions of weather, thus making complete the cycle of carbonation, oxidation, vegetation and further production of carbonates, for it is in limy soils that vegetation best flourishes, except where the alkali carbonate accumulates, however, there vegetation is killed and the cycle interrupted.

Iron compounds, especially the oxides, hydrate readily in wet weather. Granitic rocks have been known to crumble due to hydration of their component parts. On hydration, or in other words, the taking of water into chemical combination, the mineral expands, exerting a powerful shattering force that crumbles the rock and causes it to slack down to powder. The breaking down of concretions or "nigger heads" thrown out from shale banks, illustrates the destructive force attendant upon hydration of iron and lime.

Dehydration is the reverse of hydration. Its effect is merely to change the color of the clay and make easier the oxidation of the fluxes.

All natural compounds are to some extent soluble in water.

Dr. M. Fiebekarn gives the following citations of ex-

periments conducted to show the solvent powers of water. C. Dolton found anorthite, treated in form of floated powder, with distilled water several weeks at 80° C., was dissolved.

E. W. Hoffman found similar solubility for talc, potash mica, magnesia mica, etc.

Danbree found that by treating potash feldspar in a rotating drum, the water contained notable quantities of potash and silica.

The solvent power of water is greatly supplemented by organic substances like humic acid as well as by carbonic, nitric, sulphuric and hydrochloric acids and their compounds. For instance, 10,000 parts of pure water dissolves only 0.13 parts of carbonate of lime, while the same amount of carbonate water will dissolve 10.0 parts, or seventy-six times as much carbonate of lime.

Chemists would say that this increased solvency is the result of mass action and that the solvent action is proportioned to the effective mass. By this they mean that an exchange of component parts by the inter-reaction of the substances takes place between the salts in solution, until all are satisfied and are in their most staple condition.

Van Hise says that if all the important bases occurring in the rock making minerals were equally abundant, the stronger bases would be taken into solution to a larger extent than the weaker bases. Therefore the order of solution, and this is confirmed analytically, would be potash, soda, lime, magnesia, iron and alumina.

T. M. Read calculates that throughout the entire globe there is removed about 96 tons of material per square mile, so it is readily seen that the solvent of water is a powerful factor in bringing about changes in the clays. Particularly is this true in limestone regions where the limestone skeleton of the rock formation is dissolved away, leaving as a residue some of our most valuable clays.

Deposition of the dissolved salts follows as a natural sequence, but deposition is generally the result of change of condition such as supersaturation due to evaporation of a part of the dissolving medium, or the action of life upon the dissolved material as in the seas, etc.

By virtue of the solvent power of water, oxides of silica, iron and alumina, the carbonates of lime, magnesia and iron, the silicates both hydrous and anhydrous, sulphides, particularly those of iron, are carried from the upper to the lower strata of our earth's crust making possible the formation of new rocks.

The cycle of rock disintegration, dissolved substances, precipitated compounds and rock formation is continuous. This cycle is made possible by the selective tendency of like materials to segregate and crystallize. To the recrystallization of material that was once in solution is credited our gneiss, schists, many of our slates and sedimentary rocks of all description.

Mechanical action of heat and pressure metamorphose shales into slates and eject new rock forming substances from the interior of the earth into crevices and faults which in time pass through the cycle of decomposition, clay formation and remetamorphosing into new rocks. Nature seems to operate in cycles and there is no doubt, judging from the depression of a part and the uplifting of another part of the Atlantic coast that this earth will experience serious revolutions in its makeup in the next geological age.

THE CLAYS.

Having considered the agencies or forces at work altering the rocks and clays, we will now trace the probable history of the several types of clays. In this I am going to follow the general outline of Prof. Orton, Jr.'s classification of clays, modified to some extent.

Kaolin: When a rock is broken down by any of the agencies or combination of agencies the end product of interest to clayworkers is the resultant clay. From minerals in the rocks that are free from iron we obtain directly the pure clay called kaolin or china clay. From minerals containing iron we obtain impure kaolin. The impurities in these clays may be leached out by the solvent action of water, assisted chemically by some of the many chemical agencies before alluded to, leaving as a residue a pure, white burning clay. Whether or not this has been the history of many of our kaolin beds is unknown. Many of the kaolin beds, however, are so situated as to make the leaching effect of water as a purifying agent untenable. For instance, the kaolin beds of Cornwall, England, are said to be far below the effective region of surface water and that evidences are noted that the decomposition of the parent rock is the result of the action of fluorine.

Pure clays may also be derived from the weathering of volcanic ash or fused materials known as erupted rocks that have been forced through fissures in the earth's crust.

Whatever is the history or impurity of the original clay formed in situ., i. e., its place of formation, its physical characteristic is lack of plasticity. By geological agencies, this non-plastic clay is removed from its place of formation to other beds, seldom to find a permanent resting place, but for ages it may be sorted, contaminated, purified, and redeposited, first under one condition, and then under another, until at last they are today in a more or less plastic condition, laid down in beds where from its developed physical and chemical properties it is known as ball, fire, bog, alluvial, shale, and bolder clay, etc.

Ball Clay: "Ball clay" is a commercial term used to designate the purer plastic clays. It can not be classified as ball clay by its purity altogether, for there are some fire clays that are just as pure, but which are differentiated from ball clays by their manner of formation and color when burned.

If in the working over, by geological agencies, the pure kaolin escapes contamination or its contaminating substances are such as can be leached out by percolating waters, and the clay in this process acquires plasticity, we have as a result a ball clay. If the impurities are mineral detritus alone such as is found in the Florida and Missouri ball clays, they can be purified commercially by washing and sedimentation. A few of our ball clays are thus prepared for the market. A few ball clays, such as the English, Kentucky and Tennessee ball clays, are found to be sufficiently free from contamination to be used direct from the mine.

Should the original kaolin with its contaminating substances be deposited in swampy districts as was the largest part of our country before the recession of the ocean to its present bed, then the clay will be rendered more impure by unfiltration from the higher lands, by water, and in turn, purified by the heavy swamp vegetation, by virtue of processes before cited. By the time that the geological conditions are favorable to the metamorphosing of the vegetable deposits that have been preserved from decaying from the fact that the water and mud in which they fell prevented the oxygen in the air to come in contact with them, this deposit will be purified to a greater or less extent. Or this purification may be affected later by the leaching effect of water when this deposit is raised from the swamp level, to high ground as was the case with the coal measures at the time of the recession of the oceans. To the degree of purification by the agencies of plant life or percolating waters, or both, we have our different grades of fire clays, ranging from very impure, known as "bastard" or "No. 2," to purest or "No. 1" fire clay.

Now under some conditions this fire clay may be left

plastic and under others nonplastic. As a case in question, may be mentioned the flint fire clays. The cause of this latter differentiation is unknown. Chemical analysis fails to reveal the secret. By hypothesis we can claim that the clay had never been rendered plastic since its formation, by the weathering of the parent rock. Or we can claim it has been indurated by infiltration and absorption of cementing substances such as soluble silica. All clays have revealed the property to absorb soluble salts and if by pressure or long contact the absorbed substances should become chemically combined with the clay in part or in whole, or rendered insoluble, these soluble salts would not be leached out again, but remain as a cementing material. There are evidences in favor of either hypothesis.

Flint fire clay, according to Wheeler, is found in Missouri, in sink holes in milestone, the underground outlet of which had been choked. In these instances, the clay has probably not been purified by the leaching of plants or water, but rather are more liable to be in the same condition of purity or impurity, as when deposited.

Shales: Instead of finding a permanent resting place, some of the materials that might have been ball clays or fire clays, have continued their migration by means of streams, being continually sorted and contaminated until finally the finer grained portions were deposited in still, deep waters. If not altered, they would remain as mud or marks but due to being elevated by some movement of the earth's crust, and by steady pressure exerted upon the deposit, squeezing out the water, the particles of the mud would be brought so close together as to come within the limits of molecular attraction. This process of welding clay particles together by pressure is practiced daily in the manufacture of clay wares. That this is a possibility we know and it is safe to suppose that that is the history of the hardening process by which this fine grained mud was altered into the hard shale.

Chemical alteration of the mineral detritus or realteration of the compounds as well as the infiltration of some cementing constituents which were previously in solution in the swamp waters, may have taken part in the consolidation of the mud into shale. But for the most part, it is fair to assume that compression brought about by some movement of the earth's crust was the main cause of this change. That dehydration and its consequent hardening effect may have taken place after deposition of the shale material is a very great possibility as evidenced by the fact that there are transitions in such depositions from the very soft plastic shale on the one hand, to the hard nonplastic slate on the other, with an accompanying decrease in amount of water of hydration. By this process of hydration and dehydration in shale deposits the kaolin or clay substances may be altered. We have no means at present ascertaining the truth of this conjecture, yet its possibilities can not be questioned. If it is true, this might explain in part the peculiar properties of the shales that adapt them to paving brick manufacturers; such conjectures are justified by what we know of the composition of shales, and in time we will know more exactly the relations between the amount and character of alterations to the physical properties of the shale products as developed in the manufacturing processes. If within the province of the geological chemist to disclose to us these conditions and determine what these properties are that make a shale valuable.

Shales have been formed in nearly all of the geological eras and there is no known reason why they are not all equally adapted to paving brick manufacture. It may be that the newer, or coal measure shales are composed of material that have been worked over and over for a longer period of time and have thus acquired physical properties

that make the shales better adapted to paving brick manufacture. This is another problem for solution by the geological chemist.

Varieties of Shales: According to their mineral character, Prof. Orten has classified shales into clay shales, sandy shales, calcareous shales, ferruginous and bituminous shales.

Owing to the fact that the shale material was deposited from running water it can be readily seen that a great variation in its mineral character is highly possible. That this is true even in the same deposit is to be seen at every shale bank.

One of my pupils once said "that an alluvial clay was a shale yet unborn." Poetic or ridiculous as this definition may be, it is emphatic in that the shale material differs from the ordinary alluvial deposits only by its fineness of grain, method of deposition and, later, induration.

Bog Clays: Bog clays are collected in still, shallow waters and marshes. Should vegetation thrive and their remains accumulate unoxidized, or in other words, be preserved, and the whole deposit be raised so as to ultimately be drained, we might have the impure bog clays converted into the purer fire clays. Bog clays suffer contamination from infiltration and want of drainage, altering their character and adaptability for manufacturing purposes very greatly. Bog clays are, as a rule, of very little economic value.

Glacial Clays: The study of glacial action and the glacial debris left after their recession is too profound to warrant more than a passing comment at this time. To the glaciers we credit the heterogeneous sheet of debris covering our Northern Middle West, making the rich soils of the prairie lands, leaving the limy and gravelly deposits here, and the fire silt or loam there. This debris varies in character as the parent rock or soil over which, and through which the glacier plowed its way from the North. From glacial deposits we obtain material that is extremely fine grained, such as that of the Albany slip, so valuable as a stoneware glaze, up to the worthless gravel deposits known as boulder clays. Where by subsequent sorting and redeposition by running water, glacial material has been worked over, we have a material that is often of great economic value.

Alluvial Clays: As has been indicated in several places in the foregoing discussion, water is an extensive sorting agent, depositing in succession, from the head of the stream to its mouth and even out into the ocean, debris ranging from boulders to the finest of silts. Along a river course in eddies and places where the force of the stream may be arrested, there the finer particles may be deposited. Many of these deposits are valuable for clayworking purposes.

Loess: The discussion of the origin of loess calls out a great diversity of opinion. The sandy granular surface clays of the Mississippi Valley is in many places loess. Whether it is wind blown or water deposited is a very much mooted question. The sharp angular character of the grains and the lack of definite stratification has led many to favor the "wind blown" theory. Those favoring the "water deposition" theory argue that much of the glacial debris was ground very fine by mechanical action of scouring, so fine in fact, that the material will float in water for a long period of time, and so fine as to render attrition or further commutation impossible, thus the angular conditions of the loess particles.

Whether wind blown or deposited from water, we have in loess the valuable clay that lends itself so advantageously to the dry press process of brick manufacture.

In conclusion, let it be stated that the history of any of these clays could have been otherwise, and likely the most diversified clays, as we now find them, had the same origin.

They shade one into the other so nicely that only the more pronounced types can be determined, and it is not infrequent that a clear identification of a given clay is possible. Geological, chemical and organic agencies have all played a large part in giving the separate clays their characteristic properties and time in which these agencies operate is so long and slow that their work may be arrested in all stages of completion. The general tendency is, however, to complete a cycle from one condition to another depending upon local circumstances for the rapidity of the completion of the cycle. The biography of clays, as has been before suggested in the introductory remarks, can not be recorded in its completeness, but the relationship between all types of clays can be traced as has been attempted in this paper.

POTTERY WORKERS WILL DEMAND BETTER SANITARY CONDITIONS IN FACTORIES.

Akron, O., June 30.—Important matters will come up before the convention of the National Brotherhood of Operative Potters, which will meet in this city the week of July 9-14.

On account of the existence of an agreement between the brotherhood and the United States Potters' Association, signed at Philadelphia in October, 1905, no increase in the wages of general ware workmen will be asked, but the sanitary pottery workers will ask for an increase in wages by presenting a resolution at the convention here week after next. It is asserted that there has been no increase in the wages of this class of workmen for four years. The workmen in the plants of Akron, Wheeling, W. Va., Trenton, N. J., and Kokomo, Ind., will profit by this increase if granted.

The convention will probably ask manufacturers to employ men to sweep the floors on the clay shops, the aisles and steps after the workmen leave, the object being to obtain a better sanitary condition and to lessen insurance risks. The workmen will sweep the benches, but the companies will have to pay for the other sweeping, according to the proposition that will come up.

A resolution will be presented at the convention to establish a sick and funeral fund under the care of the national officers of the association. A provision will be made that the fund shall be left untouched, for thirteen weeks after its establishment, and the benefits shall be \$100 for deaths and \$5 a week in cases of sickness. There is a belief that the delegates will not authorize the fund, but will not object to it being established in different potteries or locals.

It is said that all national officers will be re-elected. This means that Thomas J. Duffey of East Liverpool will succeed himself as president and Frank Hutchins of Trenton, N. J., as secretary.

President Duffy and the members of the auditing and executive committees will come to Akron next Friday and begin work the next day. The auditing committee consists of A. T. C. Potts and James Devlin of Trenton, N. J.; A. V. Gilbert and Joseph Smith of East Liverpool and T. J. Mumford of Akron.

The brotherhood consists of 7,000 members, who will be represented here by delegates from all parts of the United States. The Akron Central Labor union, of which T. J. Mumford has been president, will entertain the delegates royally.

HAPPY THOUGHT BRICK CUTTER.

Happy thought is a cutter for cutting brick which is claimed by the manufacturers, the Wallace Manufacturing Company, Frankfort, Ind., to cut brick successfully and profitably.

During years of experience in the manufacture of brick and tile machinery, they have observed that it requires but 50 pounds of pressure to force a number eighteen wire through a column of clay 4 1-2 inches thick and 9 inches long.

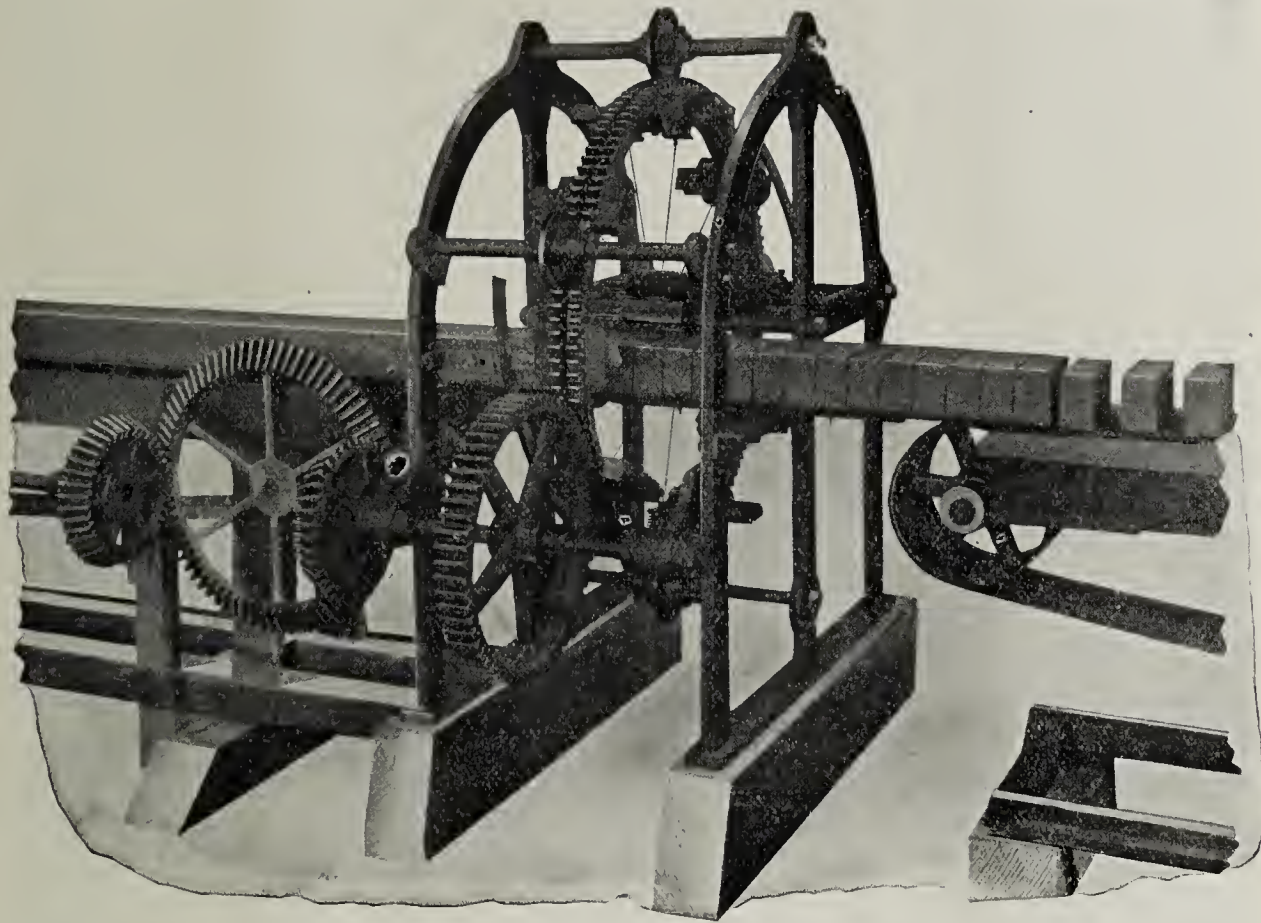
They have also learned and fully demonstrated, that where the clay is of the proper density, the column will produce a pressure of 210 pounds without "stoving" or injuring the brick, thus leaving a surplus of 160 pounds, which power may be applied to an apparatus for the cutting

holding the wires, come in contact with the cam, at the same time, the wire comes in contact with the column of clay. The cams move the slides concurrently and uniformly with the column of clay while the cutting operation is going on the cutting appliances are driven by the power from the column of clay without interfering with the movement.

After having passed through the column of clay, the wires come in contact with cams, which move them back to their former position.

It can be readily seen that the faster the clay emerges from the brick machine, the faster it will drive the Cutter and there is no limit to the number of brick this Cutter will cut.

The large gear, which carries the outer end of the wires, is held in position and is forced to travel in a direct course



Happy Thought Brick Cutter, made by Wallace Mfg. Co., Frankfort, Ind.

of the brick. With this as a basis, the result of reasoning was to the effect that it was necessary to reduce the weight and friction in order to get a contrivance by which we could place the wire at a given point with 50 pounds pressure, which is necessary to force it through the column of clay, as a result, every box, bearing and cam in the "Happy Thought" Cutter has roller bearings, thus reducing the friction to a minimum, using but four cog wheels, and the culmination is a perfect automatic brick cutter.

As you will see by the cut, the "Happy Thought" Cutter has one large gear and on the inner part of this gear is fastened one end of the wire, the other end is fastened to a center, which travels in unison with the large gear. At each end, the wire fasteners are fixed on slides with ball bearings.

As the column of clay emerges from the Brick machine, it sets the reel in motion and as the wires revolve, the slides

by four roller bearing disks, which work in a groove cut in the large cog.

The registering of the column of clay is done by the receiving belt, and as you will observe, each revolution of this registering pulley drives the cutting reel twice around, as the gear on the registering shaft is twice the size of the one on the driven.

In this short space, we have fully described to you the "Happy Thought" and while this short description may seem brief to you, yet, we have nothing to add as there are no clutches, springs nor heavy machinery to elaborate on or set forth why it is necessary to have same, as they have eliminated all unnecessary machinery.

M. E. Jacobs, Berlin, Ct., has bought the Kahms property, 35 acres of good clay land, on the N. Y., N. H. and H. Ry., and will start a new brick yard, having recently sold his yard to Hotchkiss Brothers.

THE NEW YORK GRANITE BRICK CO. AND TESTS OF SAND-LIME BRICK.

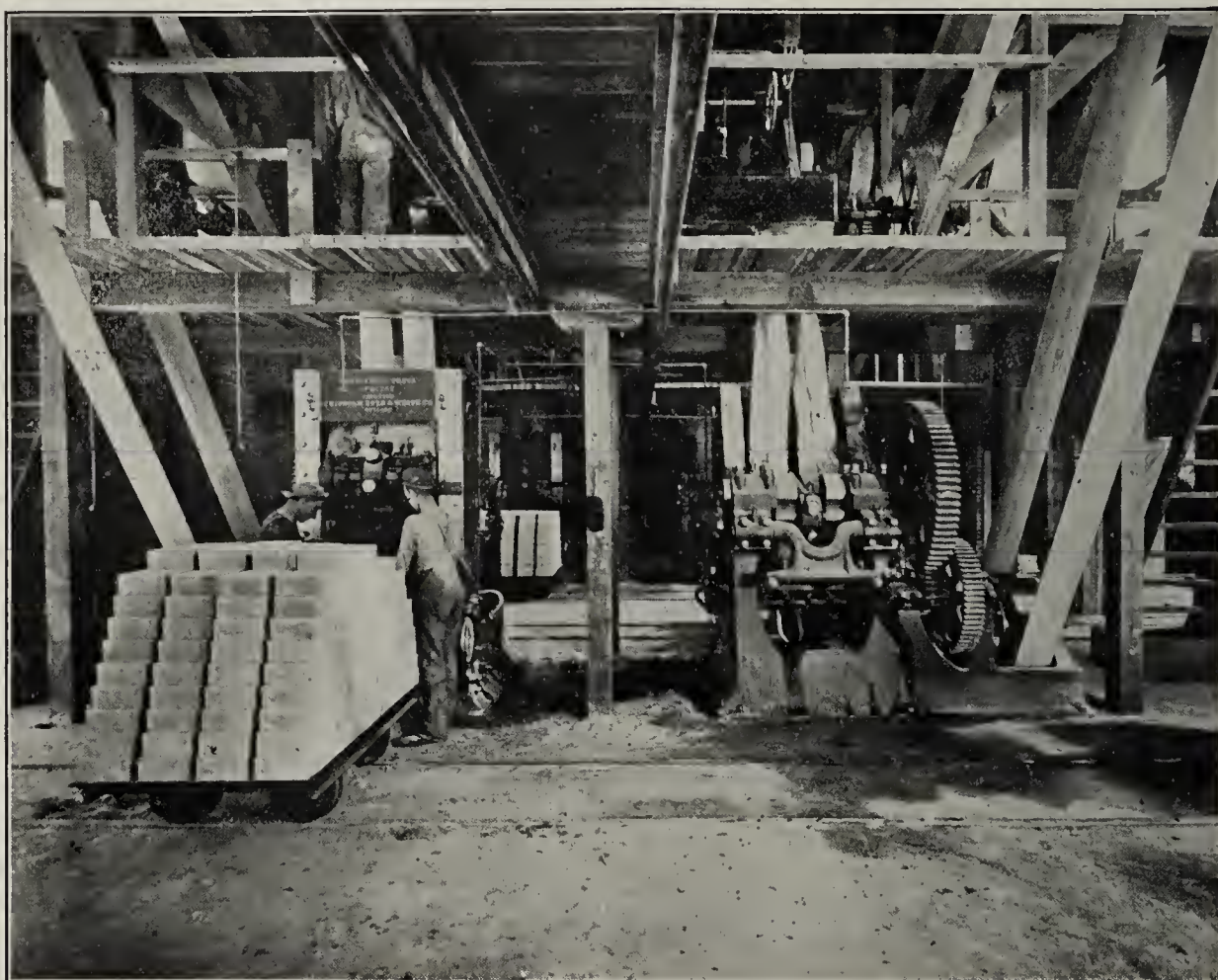
An event of notable interest in the sand-lime brick industry is the installation of the factory of the New York Granite Brick Company at South River, New Jersey. This is the largest sand-lime brick plant in the United States, having a daily capacity of 100,000 bricks, and the output of the plant is already sold for months ahead, so that the company is obliged to refuse orders.

If it had not been already fully demonstrated, the quality of the product of the South River factory would convince every user of building material as to the excellence of sand-lime brick when properly made. A number of these bricks were recently subjected to severe tests by Prof. Ira H.

$\frac{1}{2}$ Common brick	73,000 lbs.	5301 lbs. per sq. in.
$\frac{1}{2}$ Common brick	69,400 lbs.	4867 lbs. per sq. in.
Average:		4784.8 lbs. per sq. in.
Average required by Bureau of Buildings:		3000 lbs. per sq. in.

TRANSVERSE TEST (BREAKING).

Maximum Load:		Modulus of Rupture:
I Common brick	1350 lbs.	745 lbs. per sq. in.
I Common brick	1360 lbs.	720 lbs. per sq. in.
I Common brick	980 lbs.	536 lbs. per sq. in.
I Common brick	1290 lbs.	680 lbs. per sq. in.
I Common brick	1260 lbs.	664 lbs. per sq. in.
I Face brick	1300 lbs.	615 lbs. per sq. in.
I Face brick	1550 lbs.	738 lbs. per sq. in.
I Face brick	1130 lbs.	544 lbs. per sq. in.
I Face brick	1100 lbs.	530 lbs. per sq. in.
I Face brick	1550 lbs.	740 lbs. per sq. in.
Average:		651.2 lbs. per sq. in.
Average required by Bureau of Buildings:		450 lbs. per sq. in.



Interior of New York Granite Brick Co.'s Factory.

Woolson of Columbia University, who is the official brick tester for the building department of New York City, and the results of the tests are the best ever obtained from any commercially made sand-lime brick. We print here a record of these tests, which speak for themselves.

TESTS OF SAND-LIME BRICK.

Brick manufactured at South River, N. J., by the New York Granite Brick Company. Office 114 Liberty Street, New York, N. Y. Approved by New York Bureau of Buildings, June 11th, 1906. This approval is given as a result of the tests of our product made by Prof. Ira H. Woolson of the Mechanical Department of Columbia University, a summary of which is as follows:

COMPRESSION TEST (CRUSHING).

Maximum Load:	Ultimate Strength:
$\frac{1}{2}$ Common brick 62,300 lbs.	4347 lbs. per sq. in.
$\frac{1}{2}$ Common brick 66,200 lbs.	4688 lbs. per sq. in.
$\frac{1}{2}$ Common brick 66,100 lbs.	4721 lbs. per sq. in.

ABSORPTION TEST "COMMON" BRICKS.

Specimen	Per cent absorption after soaking.				
	30 mins.	2 hrs.	4 hrs.	24 hrs.	48 hrs.
No. 1	8.7	14.0	14.2	14.5	14.8
No. 2	3.8	6.3	8.0	12.8	14.9
No. 3	4.6	8.5	11.3	14.2	14.9
No. 4	2.3	3.8	4.7	10.2	11.7
No. 5	4.9	5.6	11.4	13.8	15.
Average:					14.2
Average required by Building Bureau not more than:					15.0

FEEZING TEST.

The specimens were first soaked in water ten days then removed and placed in the dry freezing atmosphere of a refrigerator room. After 23 hours they were taken out and thawed in water varying in temperature from 100° to 150° F. The thawing occupied 45 mins. to one hour. After being thoroughly thawed they were again placed in the freezing room and this was repeated twenty times.

The bricks were weighed before the test began and after the last freezing, and the loss calculated in per cent was as follows:

PERCENTAGE DECREASE IN WEIGHT DURING FREEZING TEST.

"Common" Brick.	
Specimen.	Per cent decrease.
No. 1	1.33
No. 2	2.28
No. 3	1.37
No. 4	0.71
No. 5	1.3
Average:	1.39
Average required by Building Bureau not more than 10 per cent.	

PERCENTAGE DECREASE IN STRENGTH DURING FREEZING TEST.

This test shows loss in strength of 28 per cent.
The Bureau of Buildings requires that the loss in strength be not greater than 33 1-3 per cent.

The factory itself, which is situated about twenty miles from New York, is a monument to engineering skill, all the equipment being carefully designed and installed to insure the greatest durability of the machines as well as efficiency and economy of production.

The sand is carried from the bank to a very large rotary fire drier, which has a drying capacity of thirty tons an hour when reducing the moisture in the sand five per cent. At the depositing end of the drier is a rotating screen, which allows the sand to pass through while gravel or any foreign matter is discharged over the end.

After being properly dried the sand is elevated into a large, specially designed storage bin. Immediately under



Factory of the New York Granite Brick Company at South River, New Jersey.

FIRE TEST.

OBJECT OF THE TEST:

To ascertain the effect produced by heating the brick to a high temperature, then plunging under a stream of cold water or allowing them to cool slowly in air.

METHOD OF TEST:

Six half bricks resulting from previous transverse tests were taken for this test. They were all placed in a gas furnace so arranged that while the flame could play about them, the sharp jets of blue flame could not strike them. The furnace was cold at the start and the heat was gradually raised to 1700° F. in about 60 minutes and held at that temperature for ten minutes longer. The temperature was continuously and accurately recorded by an electric pyrometer.

At the expiration of the test the bricks were removed from the furnace and one of them immediately plunged under a stream of cold water, while the other was allowed to cool slowly in the air.

Previous to the end of the test one specimen was taken from the furnace just at the time when it began to show a dull red heat and was subjected to the stream of cold water. The other specimens remained the full period of the test.

THE RESULT OF THIS VERY SEVERE TEST WAS EXCEPTIONALLY GOOD AND ENTIRELY SATISFACTORY TO THE BUREAU OF BUILDINGS.

this is a rotating feeder which measures the sand and divides it into two parts of unequal quantity; the smaller portion goes directly into the tube-mill where with a small percentage of lime it is ground to a fine powder, the larger quantity is conveyed on a belt to the delivery end of the tube-mill where it is discharged into a blade mixer with the pulverized material from the tube-mill.

The lime used in the process is crushed to a fine powder so that it will pass through a one-sixteenth inch mesh screen. The lime is elevated from the crusher and lime house to a bin erected by the side of and connected with the sand bin. Under this bin is a suitable feeder connected to the same shaft as is the sand feeder, which by automatic measuring conveys accurately any quantity of lime required, usually about five per cent.

The lime fed in this way is discharged into the same chute as the lesser quantity of sand, and passes with it on

the same conveyor into the tube-mill. When the finely ground sand and lime mixture leaves the discharge end of the tube-mill, it is delivered into the blade mixer, where, as stated above, it joins the portion of unground sand and is thoroughly mixed with it, filling all interstices between the larger grains of sand.

In the first half of the blade mixer the sand and lime are thoroughly mixed dry, each particle of sand being completely covered with lime dust, and in the second half sufficient water is added to thoroughly slake the lime, thereby beginning the formation of the bond. After this very complete mixing the material is elevated to a hydration bin where it remains twenty-four hours, and on the following day it is conveyed on a belt to an elevator. From this it is discharged into a spiral feeder and conveyor-mixer which delivers it to the press in a regular measured quantity, opportunity being allowed while in the conveyor-mixer for the addition of moisture, if necessary, so that the material will be in perfect condition for the press.

When taken from the press the bricks are stacked on steel tray cars and run into a hardening cylinder according to the regular usage in sand-lime brick factories, and hardened under a steam pressure of 125 pounds. There are three Abbe tube-mills, each 5 x 22 ft., in this large factory, six hardening cylinders and six Special Boyd sand-lime brick presses. The presses are provided with different molds so that the plant can produce not only face brick of standard or Philadelphia size but also common brick, New York size, and Ashlar blocks, plain and rock faced, beveled blocks, tool-edged and pick-faced blocks, as well as bull-nosed brick and other ornamental shapes. The mixers, conveyors, elevators and other transmission machinery were furnished by Stephens-Adamson Manufacturing Company of Aurora, Illinois.

The factory was constructed by the Standard Brick Machinery Company, engineers and contractors for sand-lime brick plants, 114 Liberty Street, New York, under the direct superintendence of their engineer, Mr. Colby M. Avery, and the company is to be congratulated on the fine job they have achieved.

SAND AND LIME BRICK STANDS GREAT PRESSURE AND HEAT.

The City Architect, Toronto, Ontario, after exhaustive tests, has passed the new sand and lime brick, and several buildings which were held up awaiting the result of the tests are now released.

The brick tested showed unexpected strength and resistive powers. It only crumbled after 120,000 pounds had been applied to a single brick. The highest pressure on any other brick tested at the School of Practical Science was 98,000 pounds. The new brick, too, withstood half an hour in 4,000 degrees of heat. The building regulations require brick able to withstand a pressure of 6 tons to the foot. The sand and lime brick have been tested to a pressure of over 200 tons to the square foot.

DEPARTMENT OF GEOLOGY AT UNIVERSITY OF ILLINOIS NAMES CAUSE AND CURE FOR EFFLORESCENCE ON BURNING MATERIAL.

J. C. Jones of the department of geology of the University of Illinois at Urbana has just completed for the School of Ceramics a study of the causes and cure of efflorescence of brick which will be published in the forthcoming volume of the Transactions of the American Ceramic Society.

This efflorescence, which is also known as whitewash, kiln white, dry white, wall white, etc., is the white crystalline substance which appears on bricks both before and after they are laid in the wall, seriously disfiguring many otherwise most attractive buildings. This disfigurement was at one time considered so serious a matter that a reward of \$100,000 was offered for the discovery of its cause and cure. In his paper Mr. Jones has endeavored to bring together all that was known upon his subject, and has added the result of some researches of his own.

He finds the causes of efflorescence to be:

1. Soluble salts contained in the clay as mined.
2. Soluble salts developed in the clay by weathering.
3. Soluble substances formed in the clay during burning, partly by chemical changes among the ingredients of the clay itself, and partly by interaction between the materials of the clay and kiln gases.
4. Soluble salts in the mortar used to bind the bricks in the wall.
5. Soluble substances developed by reactions between the ingredients of the mortar and those of the clay.
6. Soluble salts in the water used in the manufacture of brick or mortar.
7. Soluble salts in the soil or substances lying against the wall.

He finds that efflorescence usually is made up of sulphates and carbonates with occasionally salts of other acids which are carried to the surface of the bricks by the evaporation of water which has entered them.

The suggested cures are:

1. The use of clay which has not been weathered.
2. To weather the clay and then wash out all soluble salts.
3. To change soluble into insoluble salts by introducing some precipitating agent as barium.
4. To remove efflorescence which has been formed in the kiln by alternating oxidizing with reducing conditions during the latter part of the burn.
5. To coat the bricks as they come from the machine with some organic substance.
6. To burn the bricks so that they will absorb the smallest possible amount of water.
7. To coat those portions of the wall below the ground with waterproof paint.
8. To see that the gutters and flues which carry water or steam pipes are so constructed that water cannot reach the walls.
9. To make mortar joints as thin as possible, and use mortar which is free from sulphur or nearly so.

BLACKMER & POST PIPE COMPANY LARGEST MAKERS OF VITRIFIED-CLAY PRODUCTS.

The credit of having the largest manufacturers in the United States of exclusively vitrified-clay products belongs to St. Louis, Mo. The institution is the Blackmer & Post Pipe Company, and its production in vitrified clay includes sewer pipe, wall copings and drain and conduit tiles. In the twenty-eight years that this establishment, part of the time as a firm and part of the time as a corporation, has been engaged in the manufacture of clay products, four different factories have been built in St. Louis to accommodate the constantly increasing volume of business which it has done.

Lucian R. Blackmer came to St. Louis from Vermont in 1867, and Lewis W. Post came here from Connecticut in 1872. Both Mr. Blackmer and Mr. Post had been identified with clay-manufacturing interests when, in 1878, they formed the firm of Blackmer & Post. The first factory built by the firm was completed in 1880, and subsequently three other factories were erected and equipped, the second in 1887, the third in 1892 and the fourth in 1900.

Three of these factories are running as one plant, although they are separate buildings. The site of the big plant is on the Oak Hill branch of the Missouri Pacific Railway. In 1892 the firm incorporated as the Blackmer & Post Pipe Company, its capital stock being \$300,000. Its surplus now exceeds its capital. The executive offices of the company are at No. 613 Wainwright building, and its officers are Lucian R. Blackmer, president; Lewis W. Post, vice president and general manager; E. Argo, secretary, and C. A. Doolittle, treasurer.

In 1905, to meet the changing trade conditions, caused particularly by the operation of the interstate commerce law, and to more satisfactorily supply the increasing demand for the company's products from the territory distant from St. Louis, the principal stockholders of the Blackmer & Post Pipe Company organized the Post Pipe Company, which is now engaged in building and equipping a complete plant, with all the up-to-date appointments for the manufacture of vitrified sewer pipe and other clay products, at Texarkana, Tex. The officers of this company are: Lewis W. Post, president; Lucian R. Blackmer, vice president; J. T. Wallace, second vice president, and G. R. Payne, secretary and treasurer.

There are a number of contributing causes to the success which the Blackmer & Post Pipe Company has achieved as the leading concern in the country in the manufacture of exclusively vitrified-clay products. One thing that has done much to make the company the leading one in its line in the country is the fact that its products have always been considered of superior quality, and have been uniformly kept so. For that reason the company ships its products to New York, Pennsylvania, and other Eastern States, through a territory in which a hundred factories are engaged in making the same class of goods. The company exports its product to Cuba and Mexico, and the export branch of the company's large business will be one of the features of the Post Pipe Company at Texarkana.

PETER FISHER OF SAYREVILLE, N. J., PASSES AWAY AT THE AGE OF 88 YEARS.

Peter Fisher of Sayreville, N. J., died June 29, at his summer home at Allenhurst from asthma and other ailments incident to old age. He would have been 88 years of age on October 27. Mr. Fisher had been closely identified with Sayreville for fifty-five years. He was born in New York State and in early life he was in the brick business along the Hudson. He operated a boat line in connection with it, which laid the foundation of his capital. His brother and he made bricks along the Hudson River sixty years ago and he marketed them himself on his own boat line.

Among his customers was James R. Sayre, Jr., of Newark, N. J. He became interested in the manufacture of bricks and started the firm of Sayre & Fisher in 1851. They began with one yard, the annual output of which was about 5,000,000 brick. Now the output is about 100,000,000 brick.

The partnership, which existed for fifty-five years, had never been broken. The township of Sayreville was named after James Sayre.

Mr. Fisher leaves a widow and seven children. They are Peter Fisher, William Fisher, Charles W. Fisher, Edwin A. Fisher, Richard B. Fisher, Mrs. Cornell Dunlap of Elizabeth and Mrs. R. B. Lockhart of Sayreville.

STRATTON INTERESTS TO BUILD ANOTHER LARGE FACTORY NEAR THEIR PRESENT WORKS.

The Stratton interests, owners of the Ohio River, the Stratton Fire Clay company and the Great Northern sewer pipe factories at Empire, Ohio, are to erect another mammoth plant this summer, which will make them the largest independent sewer pipe manufacturers in the world, says the Tribune, of Toronto. Plans and arrangements for the new factory were made by C. M. Stratton and J. Stanton Casey while in the east the past week.

The new factory will be located on the DeSellem farm at a point just north of the Great Northern works erected last summer, and which are now in full operation. That plant has 20 kilns and the new factory soon to be erected will be as large, if not larger.

Work will be started in the near future, and the fourth plant of the Stratton Bros. will be in full operation by the first of January.

ORNAMENTAL BRICK COMPANY TO ADD THREE NEW PLANTS.

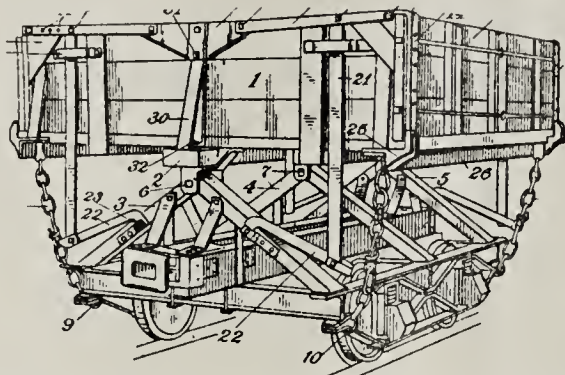
P. Shallenberger, treasurer of the Northwest Front & Ornamental Brick company of Spokane, Wash., announces that the company is preparing to install plants for the manufacture of brick and ornamental work at Seattle, Lewiston and Walla Walla.

The plant to be put in at Seattle is to have a capacity of 20,000 brick per day, and the plants at Lewiston and Walla Walla 5,000 per day each.

NEW INVENTIONS THAT ARE OF INTEREST TO THE CLAY MANUFACTURER.

These new inventions are those that are especially of interest to anyone engaged in the line of building materials and their manufacture, or machinery to make them:

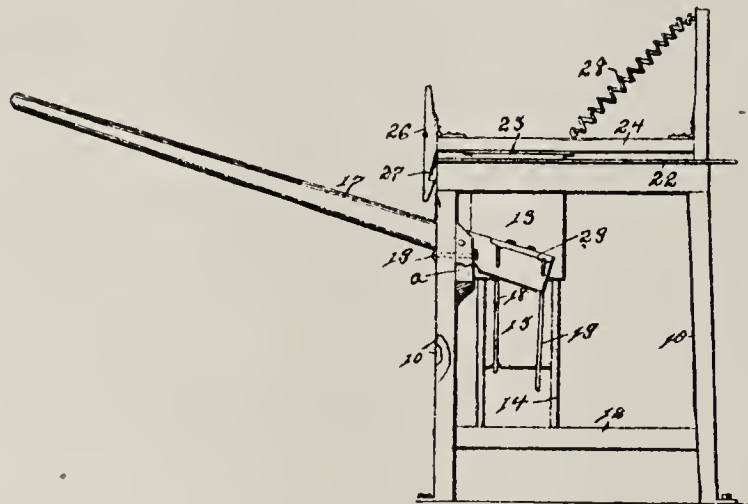
820,024. Dumping-Car. Thomas H. Stagg, Columbus, Ohio, assignor to The Kilbourne and Jacobs Manufacturing Company, Columbus, Ohio. Filed Jan. 3, 1906. Serial No. 294,370.



Claim. In a side-dumping car a side door pivotally suspended to swing freely and to tend to swing inwardly, means for maintaining said door in elevated position when the car is dumped, in combination with a member positioned between said door and said means, which member is adapted to prevent the inward swing of said door beyond a predetermined point, said door engaging with said member by gravity alone and being free to swing outwardly.

820,895. Hand-Power Brick-Machine. John A. Soderstrom, Sac City, Iowa. Filed Nov. 22, 1904. Serial No. 233,901.

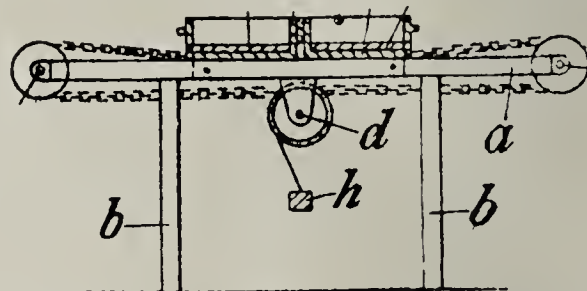
Claim.—In a brick-machine, a frame having two up-rights in parallel position and near to each other, adjustable bearings fixed to the up-rights, a lever fulcrumed to said bearings, an open-ended mold fixed to the frame at the side of the lever, a plunger fitted in the mold and means for adjustably connecting the short arm of the lever with the plunger, to operate as set forth.



A brick-machine, comprising a frame, an open-ended mold fixed to the frame, bearings for a plunger connected with the lower end of the mold, a plunger fitted in the mold, a lever fulcrumed to the frame in adjustable bearings fixed to the frame, two links of unequal length having hooks at their lower ends connected with the short arm of the lever to engage the lower end of the plunger, a stop device adjustably fixed to the plunger, a detent fixed to the hook portion of the longest link, a bar hinged to the top of the frame, a striker fixed to the frame and a latch hinged to the end of the hinged bar, arranged and combined to operate in the manner set forth for the purposes stated.

820,590. Molding-Machine for Building-Bricks. Andreas C. Mueller, Moegeltondern, Germany. Filed Apr. 17, 1905. Serial No. 256,056.

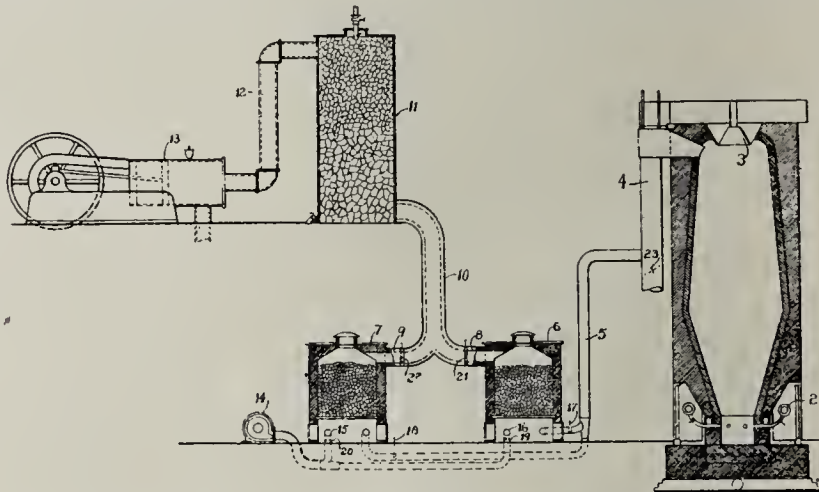
Claim.—In a molding-machine for building-bricks the combination with a suitable framework of a molding-frame, comprising a central longitudinal rib, lateral ribs starting therefrom and hinged longitudinal side walls, metal squares,



supporting planks and adapted to be laterally slid in the mold, slots provided in the vertical flanges intended to be engaged by the lateral ribs of the mold, chains attached to the outside of the squares, grooved guide-pulleys for the chains, chain-drums mounted upon a shaft and to which the chains are connected and means for rotating the said shaft substantially as and for the purpose set forth.

820,485. Process of Producing Gas. Byron E. Eldred, New York, N. Y., assignor to Combustion Utilities Company, New York, N. Y., a Corporation of New York. Filed May 11, 1905. Serial No. 259,939.

Claim.—The process of producing gas which consists in transmitting unmixed blast-furnace gases through a deep bed of incandescent fuel and collecting the resultant gas.



The process of manufacturing and using gas which consists in alternately blasting a deep bed of hot fuel with air and with waste gases from a blast-furnace, in collecting the gas from the latter operation, cooling and washing the same and delivering to a gas-engine.

821,031. Concrete-Brick Machine. George W. Dy Arman, Indianapolis, Ind., assignor of one-half to John Whitaker, Middleport, Ohio. Filed June 29, 1905.

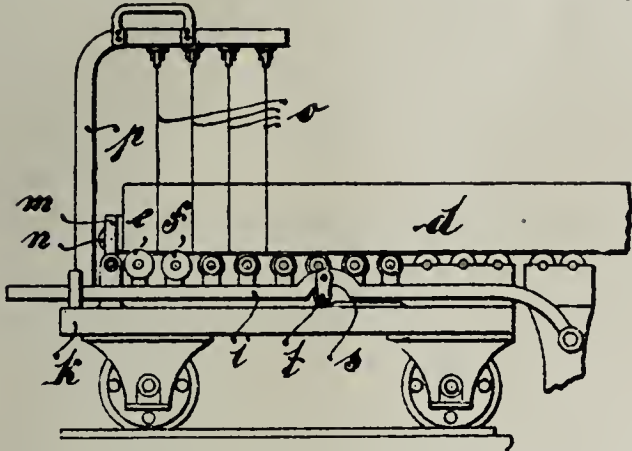


Claim.—A concrete-brick machine including a base, a plurality of upright plates mounted upon the base, a slotted combined mold-bottom and carrier, a mold-front and a mold-back having each a recess in the top thereof opposite a space between two of the upright plates, and a clamp for the mold-front and the mold-back fitting in the slots and insertible between said two of the upright plates.

A concrete-brick machine including a base, a plurality of pairs of angle-irons attached to the base, upright plates

secured to the angle-irons, a pair of angle-irons having slots therein and supporting an upright plate, screws attached to the base and extending through the slots of the angle-irons securing them adjustably to the base, a slotted combined mold-bottom and carrier provided at an end thereof with a removable filling-piece, and a mold-front and mold-back.

821,453. Device for Cutting and Setting Bricks, Etc. Friederich Beyer, Siegmars, Germany. Filed Feb. 29, 1904.

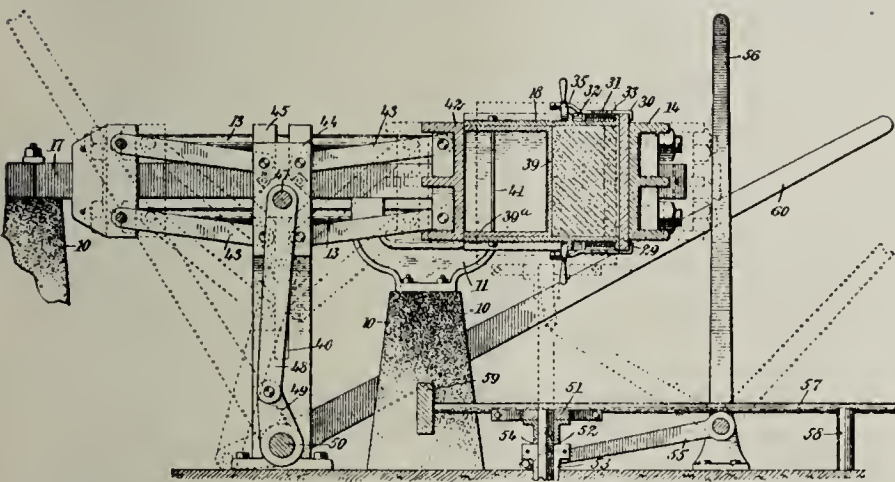


Claim.—A device for cutting and setting bricks made by a bar-press, comprising in combination rollers at the end of the bar of clay being provided with means adapted to move the bricks forward in groups with gaps between the end of the claybar and after every group of two or more bricks *a, b* and adapted to cooperate with a bar *i* fitted on the frame of the press, substantially as described and shown and for the purpose set forth.

821,270. Molding-Machine. George P. White, Wallace, Idaho. Filed Aug. 19, 1905. Serial No. 274,925.

Claim.—A molding-machine comprising a pair of heads, a movable press-head mounted between them, a toggle connecting said movable press-head with one of the first-mentioned heads, a cross-head connected with said toggle, and a toggle for operating said cross-head.

In a molding-machine, the combination of a series of pillars or supports, chairs located on certain of said pillars, a rod supported by each chair, a pair of bars supported by others of said pillars in a position parallel to said rods, a head mounted on said rods, a second head movably mounted

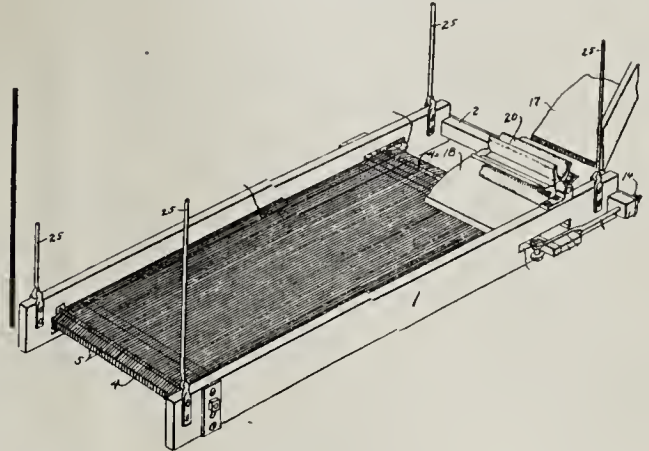


on said bars, means for forcing said second head away from the first head, a third head adjustably mounted on the rods, an invertible mold mounted between the second and third heads, said mold being mounted on trunnions located off center to balance the mold when filled with plastic material, and means on one of said trunnions for turning the mold.

821,502. Screen. Joseph Keffler, Malvern, Ohio. Filed Oct. 7, 1905. Serial No. 281,829.

Claim.—In a screen of the class described, the combination of a suitable frame, wire-supporting bars provided with spaced grooves, said bars secured to the side members of

the frame near the end thereof, non-metallic bars located near the ends of the frame, metal bars located against and in contact with the inner edges of the non-metallic bars, one of the metal and non-metallic bars adjustable with reference to the frame, means adapted to embrace the adjustable metal and non-metallic bars, metal plates secured to the non-metallic bars and their outer edges located in different vertical planes from that of the outer edges of the non-



metallic bars, screen-wires seated against the outer edges of the non-metallic bars and means for holding the adjustable non-metallic and metallic bars in fixed adjustment, substantially as and for the purpose specified.

822,600. Fire-Brick Compound. Thomas P. Gourley, New York, N. Y. Filed Feb. 28, 1906. Serial No. 303,352.

Claim.—1. A fire-brick compound comprising carbid of silicon, water, silicate of soda and an acid.

2. A fire-brick compound comprising carbid of silicon, mixed with water, silicate of soda, and sulfuric acid.

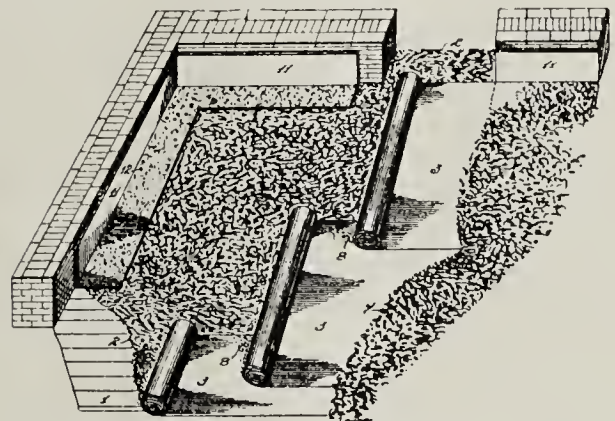
3. A fire-brick compound comprising carborundum, water, silicate of soda and an acid.

4. A fire-brick compound comprising carborundum, silicate of soda for bonding the particles of the carborundum together an acid which serves as a flux for said silicate of soda, and water for making the compound plastic.

5. A fire-brick compound comprising carborundum, silicate of soda, water and a flux.

6. A fire-brick compound comprising carborundum, silicate of soda, water and sulfuric acid which serves as a flux for said silicate of soda.

822,602. Method of Waterproofing Buildings, Etc. August Gross and Aaron C. Horn, New York, N. Y.; said Gross assignor to said Horn. Filed Dec. 1, 1903.



Claim.—A method of waterproofing flooring, comprising applying a compound of asphalt and oil to the border of the floor and to the lower portion of the contiguous wall, applying upon said compound a strip or flashing so as to cover the joint between the floor and the wall, applying said compound to said strip or flashing and to the main portion of the floor, applying a sheeting to cover the floor and the portion of said strip which lies upon the floor, and then applying a coating of said compound.

CLAY RECORD.

PUBLISHED SEMI-MONTHLY BY THE

CLAY RECORD PUBLISHING COMPANY,

Ninth Floor, Plymouth Building,

303 Dearborn Street,

CHICAGO.

GEORGE H. HARTWELL, Editor.

SUBSCRIPTIONS.

Send One Dollar bill or stamps for United States, Canada or Mexico
and one dollar fifty cents for all other foreign countries.

Papers are not stopped at the end of subscriptions unless the sub-
scribers order them so and pay up the arrearages.

ENTERED AT THE CHICAGO POST OFFICE AS SECOND-CLASS MATTER.

Vol. XXVIII.

JUNE 30, 1906.

No. 12

"I like to read American advertisements. They are in
themselves literature, and I can gauge the prosperity of the
country by their very appearance."—William E. Gladstone.

When times are dull and people are not advertising is the
very time that advertising should be the heaviest. Ninety-nine
out of every hundred merchants advertise most when there is
least need of it, instead of looking upon advertising as the pan-
acea for their business ills.—John Wanamaker.

There is no difficulty in the world that cannot be over-
come by the man who hustles.

Even though he be hard-hearted the man who butts
against fate is apt to get the worst of it.

It is the easiest thing in the world to stir up trouble; all
you have to do is to tell the truth in all occasions.

Almost anyone will take your advice, and possibly one
out of a hundred will generate faith enough to use it.

THE CLAY RECORD is the only semi-monthly Clay Journal
published in America. It gives to its readers the news of
the day before it becomes stale. The subscription price for
one year (twenty-four numbers) is only one dollar. Is there
anyone in the business too poor to get it?

The building operations of the country continue of great
volume, and, in the aggregate, are increasing over the show-
ing made in 1905, which was a red-letter year in the domain
of construction. From the tabulated reports by The Amer-
ican Contractor, and presented herewith, the gain over the
corresponding month of last year is quite general and pro-
nounced, less than 20 per cent of the leading cities showing

a loss. One of the most gratifying and encouraging fea-
tures of these reports is the wide-spread gains, which ex-
tend to all sections of the country, thus demonstrating the
general prosperity that attends building operations. The
percentage of gain in leading cities, as compared with June,
1905, are: Atlanta, 146; Baltimore, 23; Bridgeport, 65;
Buffalo, 14; Cincinnati, 33; Dallas, 43; Denver, 63; De-
troit, 4; Duluth, 198; Evansville, 175; Grand Rapids, 62;
Kansas City, 41; Louisville, 85; Los Angeles, 55; Milwau-
kee, 18; Minneapolis, 19; Memphis, 55; Nashville, 20; New
Orleans, 21; Omaha, 33; St. Louis, 85; Syracuse, 72; To-
peka, 5; Toledo, 100; Tacoma, 119. The showing made in
St. Louis is remarkable, the permits issued during the
month amounting to over three million dollars, while those
in Los Angeles aggregated \$2,371,620.

Judge Fox of the Missouri supreme court, with the con-
currence of his associate judges, has rendered a notable
decision that should serve as a warning to all who resort to
direct falsehood in business transactions in that state. The
legal principle that the purchaser must beware of what may
prove to be unsatisfactory, or disappointing, is supposed by
some to be flexible enough to cover lies and other pitfalls
to catch the inexperienced or foolish. A St. Louis case
is the basis of Judge Fox's decision. An agent there sold
a Michigan farmer twenty shares in a cement and brick
manufacturing company in which the particulars of the
capital stock and capacity of the plant were grossly mis-
represented. The seller was convicted of obtaining money
under false pretenses, and sentenced to two years in the
penitentiary, where he is now confined. The supreme
court decision is an approval of the sentence.

Judge Fox rules that "When there is an absolute repre-
sentation, false and untrue, and known to be such, the
purchaser has a right to rely upon it, and common honesty
and morality demand that the fraudulent dealers should
not screen themselves by the excuse that the party could
have detected the fraud if he did not rely upon the repre-
sentations made." Swindlers of the more extensive sort,
from the get-rich-quick operator to the cheating promoter,
have presumed much too far on the legal maxim that the
purchaser must look out for himself, and charge up as bad
investments the losses into which he is led by downright
lying and other unscrupulous arts of deception. In Mis-
souri, at least, there is a penitentiary check on the business
liar and swindler, and the highest court in the state has con-
firmed it.

The Scanlon Brick Co. has been incorporated and has
an office in Cohoes, N. Y., and works at Half Moon.

ACCIDENTS, DAMAGES AND LOSSES.

John F. Merrill has bought in the Paola, Kan., Brick and Tile Co.'s plant at Sheriff's sale for \$6,000. He will refit, remodel and enlarge it.

The safe of the South Zanesville (O.) Sewer Pipe and Brick Co. was cracked by robbers. They expected to get the Saturday payroll, but were disappointed.

Will Quinn, manager of the Georgia Brick and Clay Co.'s plant at Campana, Ga., was shot in the eye and back by a negro employee over a \$2.25 settlement.

R. Knowlton & Son, brick manufacturers in Locust St., Pittsburg, Pa., has been sued for \$2,500 damages by neighbors for injury to property caused by blasting.

Edmond West, who sued the Coshocton (O.) Brick Co. for \$10,000 damages for injuries while at work in their shale pit, received judgment for \$1,000. An appeal has been taken.

The plant of the Mohican Brick Co., at Fort Edwards, N. Y., was bid in at sale by the Dr. Russell C. Paris, owner of the bonds, covered by a first mortgage. The amount bid was \$35,000.

C. B. Carroll, son of M. J. Carroll, the Philadelphia, Pa., brick manufacturer is in a serious condition at his home, 607 N. 56th St., as a result of a collision with a trolley car while driving.

The plant of the Arthur B. Nitsch Brick Co. at Lansdowne, Baltimore Co., Md., was sold at public auction to Mrs. Annie K. Ament for \$24,500. The property consists of 79 acres and a modern brick plant.

The Continental Brick Co., St. Louis, Mo., has won its suit, affirming the lower court and giving a damage of \$14,000 instead of \$2,750, against the St. L., M. & S. Ry. for right of way through their property.

Ambrose Barrington was almost instantly killed as a result of a premature explosion of dynamite at the works of the Highland Brick Co., Highland, Md. A few days before a man had both arms crushed while repairing machinery.

John Zerbe, night engineer at the Salina (Kansas) Vitriified Brick Co.'s plant, was badly scalded while on duty at the plant by slipping into a pool of hot water. The water reached nearly to his knee and cooked the flesh instantly.

OBITUARY.

William R. Orr, aged 78 years, one of the oldest operating potters in the East Liverpool, Ohio, district, died at his home on June 25th.

Peter Fisher of the firm of Sayre & Fisher, which has made brick at Sayreville, N. J., for 55 years, died at his summer home at Allenhurst at the age of eighty-eight. He leaves a wife and seven children.

William J. Wallis, superintendent of the Albany, N. Y., Orphan Asylum, is dead. He was 50 years old, and formerly the superintendent of the Boys' Industrial School and Industrial Brick Yard at Lancaster, Ohio.

FIRE! FIRE!! FIRE!!!

Fire partly destroyed the brick works of the George F. Weaver's Sons, at Utica, N. Y.

The Preston Street Brick Yard of the Baltimore (Md.) Brick Co. was damaged by fire.

The brick works of Thomas J. Rose, on G Street and Penn. Ry., Philadelphia, Pa., was damaged to the extent of \$15,000 by fire.

Fire in the works of the Barber Asphalt Paving Co., near Perth Amboy, N. J., damaged the property to the extent of \$100,000.

The plant of the United States Gypsum Co., Toledo, O., was destroyed by fire, causing a loss of \$150,000, and throwing 150 men out of employment.

The brick plant of J. M. Ireland at Los Vegas, N. Mex., burned to the ground. The plant will be rebuilt as soon as possible in an up-to-date manner.

MANUFACTURERS OF BRICK ARE BOYCOTTING CITY BUILDERS

The Central Federated Union heard the story of the Hudson River brickmakers from Charles Hank, of Chicago, president of the International Brick, Tile and Terra Cotta Workers' Union. He directed the recent strike of the union brickmakers on both sides of the river. The strike was practically won in all but two yards in Kingston, where John B. Rose, of Rosetown, who is a big Republican politician and who wants to succeed Chauncey M. Depew in the Senate, is fighting the union.

President Hank said that the public did not know what actual misery lies behind the beautiful scenery along the Hudson, skirting that part which is used by the brick manufacturers. All the Pennsylvania coal mine evils, such as company houses, company stores, etc., find their exact duplication in the little brick-making towns.

One man had received five cents in actual cash for his two weeks' work, the company having taken the balance of his wages for rent, groceries, meat, supplies, etc.

Before the days of the union, a few months ago, the companies owned their employes, as securely as if they had been actual negro slaves of the South. In Rosetown the organizers had to sneak into the town late at night in order to get the men into the union, all approaches being guarded by day.

All labor and health laws are violated in the brickyards. While excursionists are passing up the river admiring Nature's handiwork, thousands of men are sleeping in "shaeks," after a long, hard day's work. The companies' rule in the towns is absolute.

The manufacturers, he said, are banded together against the interests of the builders, and against their own employes. They are under \$5,000 bonds each not to recognize the union, and not to send brick to this city unless they get their price for it, the price being fixed by their "trust."

Manufacturers, he added, have admitted to him that it costs them \$4.50 and under to manufacture 1,000 brick. This includes delivery. They are sold for \$14 a thousand. They have a profit of nearly \$10 on every thousand brick sold.

CLAY RECORD.

THE SECOND LARGE BRICK PLANT FOR McARTHUR.

It is now definitely settled that McArthur (Ohio) is to have another brick plant. A force of brick layers and other workmen commenced work on the Mohr-Minton Coal and Brick Company's Brick Plant, at the Company's works, just north of McArthur. It is the intention of the Company to have the plant completed in about sixty days.

Charles Smith, of Indiana, who assisted in building The McArthur Brick Company's plant, and a man of much experience in all kinds of brick work, has charge of the work of building the plant, and when the same is completed he will manage it for the company. The capacity of the plant will be about 20,000 pressed brick a day. The company expects to manufacture brick of two colors, buff and dark red, these being the best selling colors. The company will make nothing but fine brick—brick that sell for about \$15 a thousand. The output of the plant for five years in advance has been contracted, so the officers of the company know just what they are doing.

The C. W. Raymond Company, of Dayton, will furnish the brick machinery, and expect to have it here by the tenth of next month. Kilns and building containing machinery will be located about 50 feet from power house, and all machinery will be run by a motor, a fine electric plant having been installed by the Mohr-Minton Coal Company some months ago. The capital stock of the Mohr-Minton Coal Company was recently increased from \$100,000 to \$200,000 to give the Company sufficient working capital to handle its very large business. A fine quality of brick can certainly be manufactured by this company as cheap as by any other company in the United States, as an abundance of good clay and coal are found right at the plant, the supply of clay being almost unlimited on the Company's lands.

The officers of the Company are: F. E. Mohr, President and General Manager; W. C. Mohr, Vice President; J. M. Moore, Secretary; Charles B. Wescoat, Assistant Manager.

EXPERIMENT TO BE MADE BY SOUTH CAROLINA BRICK MANUFACTURERS.

One of the first parties of foreign laborers to be brought South by a local corporation, arrived in Charlotte, N. C., over the Seaboard from New York, and will be taken to the plant of the Charlotte Brick Company, of which Mayor S. S. McNinch is president, near Fort Mill, S. C.

There are thirteen of the laborers, just enough, Mayor McNinch says, for an experiment, comprising Poles, Germans, Scandinavians and Hungarians.

Several of the men landed in New York three days ago; the others have been in the country for a few weeks. Most of them are young and all are healthy and robust looking. Mayor McNinch has been confronted with the labor problem for a long time. He makes 75,000 bricks each day, and it takes from eighty to one hundred men to operate the plant. He has been employing negroes almost exclusively, and they have not given satisfaction. If the first installment proves a success, Mayor McNinch will bring other foreign laborers to his plant.

WILL BE A NEW SEWER PIPE AND BRICK CENTER IN THE OHIO VALLEY.

A section of Jefferson county, Ohio, on the main line of the Cleveland & Pittsburg railroad between Irondale and Salineville in Columbiana county will soon be classed as a new sewer pipe and brick center of this part of the Ohio Valley.

Within six months a total of possibly 70 kilns will be burning either fire brick or sewer pipe. About 41 kilns are being operated now.

The Norris Mining and Manufacturing company, at Salisbury, is operating 12 kilns and it is reported that the grade of brick made there is superior to any ever manufactured in that section heretofore.

There are 21 kilns operated by the East Ohio Sewer Pipe plant which is located midway between Salisbury and Irondale. Business with this firm is increasing rapidly and it is reported that the capacity of the works is to be increased.

It is reported that the Ohio Coal & Coke company, near Irondale, is formulating plans to engage in the clay business and that a plant is to be built by this concern to make brick.

The Pritshaw plant at Irondale which was recently sold to Pittsburg parties will operate eight kilns. This company is also shipping much ground clay to mills and furnaces which is used as a mortar.

Capt. John Porter who recently purchased the old Miner plant is having a successful business in the shipping of ground clay to mills and furnaces. It is reported that business with this plant is so brisk that employes are compelled to work overtime to keep up with its orders.

The McClain Brick company, of Pittsburg, which operates a plant at Vanport, Pa., has let the contract to Kerr, Myers & Cadman of Toronto, for the construction of 16 kilns for their new plant to be built at Irondale. It is possible this plant will not be in operation until next fall.

It has been announced in this city that a new company is being organized among local capitalists for the purpose of erecting a 12 kiln plant at Irondale, at which sewer pipe and brick will be made.

Two beds of clay in that section of Jefferson and Columbiana counties are said to be unequaled, and that further development of these deposits means additional factories.

Over 1,000 men will be employed in this industry alone in the Yellow Creek valley when all of these plants are in operation.

PLANS READY TO BE FIGURED UPON.

The plans for the brick plant which the Columbus and Hocking Coal and Iron Company are about to erect, are ready. All contracts will be let on a strictly competitive basis. No commissions whatever will be allowed, and all bidders will have an even chance of securing contracts. The plant will introduce many new features. Producer Gas will be used, and the contracts for Gas Engines and Electrical work especially will be large. Blue prints and specifications can be obtained by prospective bidders by applying to R. A. Magly, General Manager, Columbus and Hocking Clay Construction Co., New First National Bank Building, Columbus, Ohio.

WILL COMPILE A CODE OF THE IMPROVEMENT LAWS.

August H. Baer, city counsellor of Belleville, Ill., has been engaged by the National Paving Brick Manufacturers' Association, which held its national convention at Indianapolis recently, to compile a code of the improvement laws of Illinois. In legal parlance it is to be a volume on the forms, proceedings and practice as to the legal structure of local improvement cases. The main objects of the work are to simplify the proceedings and to secure greater uniformity so as not to expose the proceedings to unnecessary contention and to reconcile them with the expressions of the supreme court. Mr. Baer is recognized as one of the best authorities of the state on improvement laws.

ILLINOIS BRICK COMPANY PASSES DIVIDEND.

After a session of the directors of the Illinois Brick company it was decided to pass the quarterly dividend.

This action was taken as the result of the trade war which has existed between the Illinois Brick company and the independent, since March, and which has resulted in cutting the price of brick from \$7.50 and \$8.50 per thousand to \$4.

On July 1 the directors will mail a statement to the stockholders showing the financial standing of the company. President Prussing declared that this report will reveal conditions highly satisfactory to the stockholders.

It is apparent from the attitude of the directors of the Illinois Brick company that they are preparing for a long and hard fight. The independents are still making efforts to get matters on a more satisfactory basis, and it is said that they have been partially successful. It is understood that the Illinois Brick company, however, has had no part in these negotiations. President Prussing's statement to the stockholders follows:

"Stockholders are entitled to dividends out of surplus earnings, and it is among our most pleasant duties to declare them regularly. Our paramount duty, however, is the conservation of the business of the company. Herein we serve the interest of every stockholder.

"An industrial war has been forced upon us. During a struggle of this kind profits are sacrificed. At present the supply of brick exceeds the demand—prices are very low. We shall endeavor to keep the company in its present strong financial condition. Dividends should be deferred and our position in this market maintained.

"A statement showing the very satisfactory condition of this company on July 1 will be mailed in due course."

SWITCHES, FROGS, R. R. CROSSINGS.

The M. Mitshkun Co., of Detroit, Mich., whose advertisement will be found in our columns, manufacture and carry in stock for prompt shipment, Switches, Frogs, Railroad Crossings to fit any and all sections of rail, also industrial turntables, portable track, tram cars and all track connections. Write for Catalog "A".

SAND OR LIME BRICK OR BLOCK NEWS.

Charles Vail has put in a cement brick plant at Colby, Kansas.

Fred Brenner is in charge of the new sand brick plant at Live Oaks, Fla.

The Concrete Brick Mfg. Co., is a new industry for Little Rock, Ark. B. F. Henry is the manager.

The Owensboro (Ky.) Sand-Lime Brick Co. has been made exempt from taxes by the council for five years.

W. C. Bond, P. O. Box 336, Victoria, B. C., wants catalogues and information regarding sand lime brick machinery.

Colombia, S. A., has a sand-lime brick plant. It is located at Barranquilla, and has a capacity of 6,000,000 brick annually.

The Orlando (Fla.) Building Block Co. has been lately organized and will manufacture cement brick and building materials.

The Leigh & Gray Cement Brick Co., Blackstone, Va., is a new enterprise that has started to make brick out of sand and cement.

The Granite Brick Co., Janesville, Wis., has just installed a new fuel water or condensing boiler. They are rushed with orders.

Warren C. Dodge of Patchogue, N. Y., has been made superintendent of the New York Granite Brick Co.'s plant at South River, N. J.

The Warsaw (O.) Sand-Lime Brick Co., has been organized by Dr. Moore and others, and will build a 20,000 brick daily capacity plant on land owned by him.

Charles W. Boyle, Grand Rapids, Mich., has perfected and patented a cement brick machine and with a Detroit and Harbor Springs party will put same on the market.

The Hiawatha (Kansas) Composite Pressed Brick Co. has been organized and will erect a factory and install machinery. E. E. Sherwood is president and John A. Jones secretary.

The Waterloo (Ia.) Cement Tile Machinery Co. has changed its name to the Cement Tile Machinery Co. This was made necessary on account of the other company, the Waterloo Tile Machinery Co.

Deneen Bros., builders at San Francisco, Cal., is examining sands near Twin Lakes, Ben Lomond and Monterey, with a view of getting good sand to make sand brick. They have the contract to rebuild the Palace Hotel.

The plant of the Mohican Brick Co., at Fort Edwards, N. Y., erected two years ago at a cost of \$56,000, has been sold to G. R. Shaw and Dr. Jarvis Barraclough of Sandy Hill. They will start the plant making sand-lime brick.

The People's Cement and Brick Co., Binghamton, N. Y., has put in a Diefendorf patent sand cement brick machine. The officers of the company are: A. G. Diefendorf, A. W. T. Back and William F. Donley. The plant is on Upper Griswold St. and will make 15,000 brick daily.

MISCELLANEOUS ITEMS.

The Dillonvale (O.) Brick & Tile Co. has increased its capital stock from \$20,000 to \$50,000.

W. E. Flentge, postmaster at Cape Girardeau, Mo., and a brick manufacturer and merchant, was nominated for railroad and warehouse commissioner by the Republican State Convention.

Conley & Slemmer, Upper Sandusky, O., have burned their first kiln of brick and have had splendid success. They used natural gas for fuel.

The Golden Gate Tile Co. will rebuild its manufactory at North Beach, Sacramento, Cali., at once. The new plant will be ready by August 1st, and will cost \$100,000.

Erie Brick Company, Buffalo, N. Y., capital stock \$75,000, has been incorporated. Directors are L. B. Dorr, B. F. Davidson and Abram Bartholomew, all of Buffalo.

The Oconee Brick Co., Athens, Ga., have their first kiln of brick ready for the market. The officers are: S. C. Upson, president, and Edward S. Upson, secretary and treasurer.

The Lowatsch & Lotz Brick Co., Kingston, N. Y., capital stock \$100,000, has been incorporated. Directors are E. H. Lowatsch and E. H. Lotz of Kingston, and August Welp of New York City.

El Reno (Okla.) Brick, Gas & Oil Co. has been incorporated with \$50,000 capital stock. Directors: A. C. Kreipe, M. F. Dawson, L. A. Wilson, August McLean, and A. W. Ernest, all of El Reno.

The W. C. Beem Brick & Tile Works, Lehigh, Iowa, has been sold to the Portland (Ind.) Tile & Hollow Block Co. The company will build a 3,000-car per year plant. General offices will be at Ft. Dodge.

The Griffin (Ga.) Press Brick Co. has been incorporated with \$25,000 capital stock. The incorporators are T. E. Drewry, Chas. H. Westbrook, N. B. Drewry, J. W. Harrington, Allen Little, W. J. Kincaid, and J. W. Gresham.

The Bridgeton Brick Co., Broad street, Eatontown, N. J., has been incorporated with \$100,000 capital stock. Incorporators: J. DeWitt Ray, Eatontown; William W. Ridgley, Camden, and Littleton R. Ridgley, of Baltimore, Md.

The Middlesex Stone, Brick & Tile Co., Portland, Maine, capital stock \$250,000, has been incorporated. Promoters: James Morrison, Harry J. Palmer, of Medford; Arthur M. Torrey, Boston, and George F. Gould and M. T. Osgood, of Portland.

The Gotebo (Okla.) Oil, Gas & Pressed Brick Co., has been incorporated with \$100,000 capital stock. A brick plant has already been purchased. Directors are Charles A. Huber, of Weatherford; Joseph Huber, F. R. Wildman and Will McCoy, of Blair, and W. H. Kuder, of Gotebo.

The Clermont Brick & Tile Co., Biloxi, Miss., has been incorporated with \$50,000 capital stock. Incorporators: Z. T. Chamberlain, treasurer; J. A. Broadus, secretary; G. H. Combel, president. The company purchased the plant of the Combel Brick & Tile Co., at Clermont City, and will install more machinery.

The Carolina Clay Co., Bryson City, N. C., has been incorporated with \$20,000 capital stock.

The first brick have been made by the Kewanee (Ill.) Brick Co., a new company with E. A. Mumford as manager.

J. P. Wilson, Beaumont, Texas, claims he has found clay near town that will make sewer pipe, samples of which are at the Chamber of Commerce.

The Marengo (Ia.) Brick & Tile Co., successors to Danskin & Wagner, have put in new machinery and will increase the capacity of their plant.

It is the intention of the Kiesel Brick Co., Rochester, N. H., to rebuild their plant which was destroyed by fire recently. Modern machinery will be installed.

The Lake Superior Cement Co., Duluth, Minn., has been incorporated with \$3,000,000 capital stock by Alva L. Merritt, J. Wesley Merritt and L. C. Merritt, of Duluth.

The firm of Straight Bros., Fonda, Ia., has been incorporated with \$150,000 capital stock, as the Straight Bros. Company. They own several tile and brick plants in Iowa.

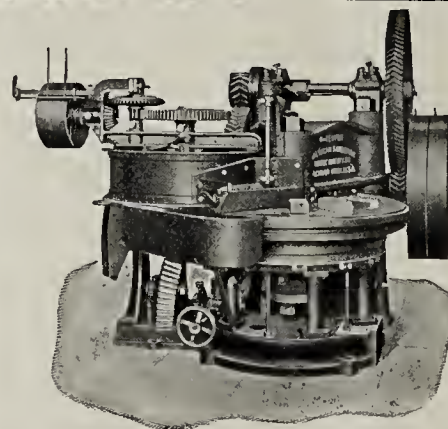
The Fairmount (Ind.) Tile Co. have traded their factory to Alexander Lindsey for eight houses and lots in Marion, Ind. Mr. Lindsey takes immediate possession and will operate the plant.

The Veedersburg (Ind.) Brick Co. has been incorporated with \$10,000 capital stock. Directors: Miles Marshall, Clinton B. Marshall and Walter D. Marshall, of Veedersburg, and Herbert Hood, of Toledo.

The Sauk Center (Minn.) Pressed Brick & Tile Co., with \$50,000 capital stock, has been incorporated. Incorporators: M. D. Hoff, of St. Paul; P. W. McAllister, of Minneapolis, and P. Lowenthal, of St. Paul.

The William G. Doyle Co., to manufacture sewer pipe, flue linings, fire brick, etc., has been incorporated, with \$50,000 capital stock. President, William G. Doyle; treasurer and clerk, A. D. Page, both from Boston, Mass.

The Vallejo Brick & Tile Co. has been incorporated with \$100,000 capital stock. Oakland, Cali., will be the principal office. Directors are F. M. Knapp, Adolf Michel, Geo. C. Davis and C. F. Rilet, all of Oakland, and S. W. West, of Salt Lake City, Utah.



KOMNICK IMPROVED ROTARY PRESS.

install the complete plant and guarantee results, and are prepared to furnish complete or partial installation.

The American Sandstone Brick Machinery Co. Saginaw, Mich.

One of these presses made 22M. brick each consecutive day of ten hours for more than six months without a breakdown. Another press made 4,235,000 the first ten months, ten hours per day run; is now making 35M. per day, day and night run. We were the first to introduce the Komnick or hydrated lime system in the United States; also to build and

The Bachus Co., which owns a brick yard at Gifford, Idaho, has opened a lime quarry at Bed Rock.

Barnett & Gurney have installed an up-to-date brick machine of 40,000 daily capacity in their plant at Ripley, Tenn.

The Merrill Brick Co., Des Moines, Ia., has been incorporated with \$40,000 capital stock. The incorporators are A. W. Field and Paul Gabrell.

It is announced that the Diana Brick and Tile Co., which owns a brick plant at Loeb, near Beaumont, Texas, will add machinery to double the capacity of the plant.

Homer J. Kendall, Lehi, Utah, has shipped several sample lots of clay to eastern parties, who wish to investigate the wonderful and inexhaustible supply of clay controlled by him.

The Evans Clay Mfg. Co., Uhrichsville, O., has been incorporated with \$50,000 capital stock by Thomas J. Evans, E. P. Uhrich, George S. Evans, T. D. Helea, James B. Westhofer.

The Charles Gehlhaus Co., Cliffwood, N. J., has been incorporated with \$125,000 capital stock. Incorporators are Otto F. Gehlhaus, John F. Hettrick, William A. Gehlhaus and William Sandlass.

The work on the new brick plant at Sandpoint, Idaho, of the Dry Pressed Brick Co., Spokane, Wash., will be completed soon. E. B. Hewitt, who has been manager, has tendered his resignation.

James F. Mock, a manufacturer of brick machinery and owner of a foundry at Hartford City, Ind., has decided to move to Jackson, Miss., transferring his industry to that place. A \$50,000 capital stock company will be formed.

The Cambridge Tile Mfg. Co., Cincinnati, Ohio, has been incorporated with \$450,000 capital stock. The company will manufacture all kinds of pottery ware. Incorporators are: A. W., Charles F., and G. J. Koch, F. W. Braunstein and W. C. Ripley.

The Wayne Brick Co. has been organized by W. A. Price, as president, and J. R. Whitman, secretary and treasurer. The office is at Waycross, Ga., and the works at Wayneville. 60,000 brick will be made daily. They purchased the plant of J. A. Montgomery.

BUILDING SUPPLIES WANTED

The wonderful progress of Northwest and Western Canada has created a tremendous demand at

WINNIPEG

for all classes of Building Material. We reach every Architect, Builder, Contractor and Engineer in Northwestern and Western Canada. We reach every Brick Yard and Clay Worker. Write us for full particulars, etc.

\$1 a year keeps you posted.

WESTERN CANADA CONTRACTOR

720 Union Bank, WINNIPEG, CANADA.

A RARE OPPORTUNITY.

One thousand acres of "Fire Clay" with lignite coal in abundance on adjoining land. Clay of the following analysis with a vein running from four to forty feet. Some of it shows the same analysis, except has much less sand.

ANALYSIS:

Telephone Connection.

CHEMICAL LABORATORY,

H. ENDEMAN, PH. D.,

Analysis, Consultations and Researches.

23 William Street, New York, Aug. 9, 1904.

CERTIFICATE OF ANALYSIS

For F. M. Greene, Atlanta, Texas.

I have examined the sample of Clay marked as stated below and find the following results:

It contains in 100 parts by weight—

Alumina	19.88	} CLAY
Silica	20.95	
Hydrate water	6.03	
Oxide of iron.	0.74	
Alkaline earths and alkalies	2.22	} SAND
Coarse sand (sample	35.00	
Dust sand	15.18	

This clay situated in Texas. Would like to put it in as stock with good people to develop it. Samples and full particulars on application.

F. M. GREENE, ATLANTA, TEXAS.

The Alliance (O.) Clay Products Co. is completing its plant, so that they will be making brick shortly.

Edgar Drake and Ora Hankinson, Sullivan, O., are building a brick and tile works on the B. W. Riggs farm, north of town.

The Brookhaven (Miss.) Brick Mfg. Co. has been incorporated with \$50,000 capital stock by L. E. Schill of Magnolia and others.

J. H. Shirley, Columbia, S. C., and J. H. Williams, of Greenville, contemplate establishing a brick works at Greenville, called the Greenville Brick Co.

Brown Brothers, Crawfordsville, Ia., whose plant was destroyed by an explosion, are getting their plant in shape again, so that it will be running soon.

The Redfield (Ia.) Brick and Tile Works, owned by Robert Goodwin Jr. has recently added another kiln, so as to try to keep up with the orders that are coming in.

The Brown Clay Works, Fort Salonga, N. Y., has been incorporated with \$35,000 capital stock. Incorporators: Juliet H. Brown, Henry C. Brown, and J. Cornell Brown of Brooklyn.

The Norris Mining and Manufacturing Co., of New Salisbury, O., has completed a shaft into a clay mine which contains an 18 foot vein of very fine clay, which is to be used for making free brick.

The Briar Creek Brick Co., Charlotte, N. C., has been incorporated with \$100,000 capital stock. The stockholders are J. B. McLaughlin, W. S. Pharr, J. H. Ross, and R. J. Foil. The plant will be on the Pharr farm, 3 miles from the city and will make 30,000 brick daily.

On account of the rush of business the American Clay Machinery Co., Bucyrus, Ohio, has started on the completing of the buildings which were started some time ago. A complete clay testing room and laboratory, which will occupy a special building, will be finished first.

The Grand Ledge (Mich.) Clay Product Co. has been organized with the following officers: E. A. Turnbull, president; W. E. Wilson, vice-president; F. A. Tabor, secretary and general manager, and A. R. Gillies, treasurer. They will erect a large plant and manufacture conduits.

CLAY RECORD.

POSITION WANTED

Position wanted manager or superintendent of a first-class brick plant, anykind of brick or hollow ware. Can construct and equip any kind of plant, and take complete charge if necessary.
G, care Clay Record.

POTTERY FOR SALE

A two kiln pottery for sale in Philadelphia, Pa. conveniently located to P. R. R. Co., to P. & R. Ry. Co. and to Wharves. In running condition for the manufacture of any line of pottery ware. Kilns 16½ feet, up draft, with decorating kiln, all as good as new. Address
2539 E. Clearfield St., Philadelphia, Pa.

WANTED

A practical man with from five to ten thousand dollars to use in promoting a number one pressed brick plant in a hustling town, and afterwards to take charge of plant. Must be a practical pressed brick man.

Promoter care Clay Record
Chicago, Ill.

FOR SALE

Two Sturtevant Fans, Pipes and Fixtures for waste heat drying.
One Steam Pump.
Eighty (80) Double Decked Dryer Cars.
One Benzing End-Cut Brick Cutter. Address
Shupe & Barnhart Shale Co.
Wooster, Ohio.

WANTED TO NEGOTIATE.

The undersigned owns 60 acres of land immediately upon the the Great Texas & Pacific Railway, west of Fort Worth, Texas, 47 miles, and 79 from Dallas, Texas, upon which there is a mountain of 20 acres of as fine brick and tile shale as can be found anywhere. Thickness of shale 40 feet above ground of valley surface, and thicker still below. Makes a cherry red brick. Wish to have a strong company formed and will take stock. Convenient to coal and water. Fine sale for product. Invite correspondence.
E. W. MORTEN.
Farmersville, Texas.

FOR SALE.

An interest in my tile and brick plant, to one o experience, that can take charge and run it. Must be able to invest some money in plant. Plenty o good clay at back door, and good market at front door. This is an opportunity that you don't often run up against. Plant now running. Come and see or write

S. H. RECORD,
Charleston, Ill.

BRICK YARD FOR SALE.

Brick Yard for sale cheap. A bargain to the right party. Good market at hand. For further information address

BRICKMAKER,
Care Clay Record, Chicago, Ill.

WANTED.

Wanted—A Four-Mold Dry Press, in good condition. Price must be reasonable. Address
T, care Clay Record,
Chicago, Ill.

FOR SALE.

Chambers End Cut Brick Machine, capacity 3,500 brick daily. 75 double deck roller bearing stiff mud brick cars.

STEELTON & HARRISBURG BRICK CO.
Steelton, Pa.

Buy a snap!
Right between best markets
In Minnesota.
Cash or time.
Kilns and everything goes.

Yes, we are going to sell.
A fine location.
Right prices
Dead sure money maker.

Write RUSH CITY BRICK CO., Rush City, Minn.

FOR SALE CHEAP.

First-class Brick Plant, or will contract with good party to make brick by the thousand, or will lease yard on royalty. 45,000 capacity daily. Ready sale at \$5.50 per thousand, F. O. B. cars at yard. Reason for selling, owner is contractor. Address
J. C. H., care Clay Record.

ENGINES AND BOILERS

New and rebuilt Slide Valve and Automatic Engines, from 3 to 200 h. p. Boilers of all types, from 5 to 150 h. p. All of our rebuilt machinery is thoroughly overhauled in our own shops by competent mechanics and modern tools. We are now offering some special bargains. Send us specifications to your requirements.

THE RANDLE MACHINERY CO.
1732 Powers St., Cincinnati, Ohio.

GIANT MACHINE FOR SALE.

A second-hand No. 2 Giant Auger Brick Machine. Address
"GIANT,"
Care Clay Record, Chicago.

FOR SALE.



Right and left-hand One, Two and Three Way Switches, of various gauges, radius and weight rail, at special prices.

THE ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—1200 Steel Crimped Pallets. 10x34 inches. Address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE—CHEAP—New and re-laying rails, 12, 16, 20 and 25 pound. For prices, address

ATLAS CAR & MFG. CO.,
Cleveland, Ohio.

FOR SALE.

One 4-Mold Dry Press, very cheap. Good as new. DEALER,
Care Clay Record, Chicago, Ill.

FOR SALE.

A brick and Tile plant, equipped with up-to-date machinery, 60,000 daily capacity, down draft kilns, inexhaustible bed of best clay suitable for all kinds of building, facing and paving brick, drain, tile, sewer pipe, etc., on two railroads, demand very good. Address
B, care of Clay Record.

FOR SALE

1 Hercules Sr. Brick Machine and Disintegrator Horton Make.
1 Grand Automatic Brick Machine with Pug Mill and Disintegrator, Creager Make.
1 Kells Brick Machine.
1 Mould Sander and Dump Table.
1 40 horse power Atlas Engine.
1 50 horse power Atlas Boiler.
1 40 horse power Gasoline Engine.
80 Brick Moulds, 12 Spring Trucks, Belting, Shafting and Pulleys, 3 Slide Cut Hand Cutting Tables. All in good order and will be sold cheap. Address
W. H. VANDER HEYDEN
Ionia, Mich.

BRICK YARD FOR SALE.

Will sell half interest in buff and fire brick plant, to experienced man who can manage it. Address
CHAS. A. MYERS, Ft. Worth, Texas

BRICK YARD FOR SALE

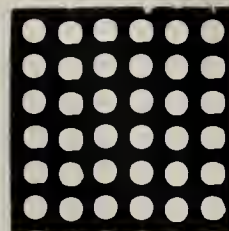
Brick Yard for sale, cheap, or to lease on shares. Write for particulars to R. N. BOAK
Middletown, N. Y.

FOR SALE OR TRADE.

One Standard Brick Machine, steam power, 30,000 capacity. 24 new Brick Moulds. 11,000 Pallets. Three Off-Bearing Trucks. All in first-class condition. Owner, E. J. SWARTZ & SON,
Syracuse, Ind.

FOR SALE.

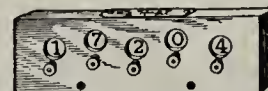
One Model "B" Four-Mould Dry Press, used only a short time, thoroughly overhauled.
Model B, care Clay Record, Chicago.



PERFORATED METALS

for all purposes
Prompt shipment of all orders guaranteed.

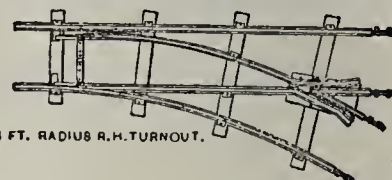
H. S. SIMPSON,
817 Chamber of Commerce
Chicago, Ill.



Paper Joggers quoted.
R. A. HART, 41 White St.,

No better made, cut from
\$8 and \$10, to
4 Wheel, \$3.00
5 Wheel, \$3.25
Guaranteed.
Sold by all dealers.
BATTLE CREEK, MICH.

SWITCHES AND FROGS



18 FT. RADIUS R.H. TURNOUT.

Right and left-hand one, two and three way switches, of various gauges, radius and weight of rail, at special prices.

M. MITSHKUN CO., Detroit, Mich.

PARTNER WANTED.

A good, reliable man of experience, with some capital to invest in and take charge of a new Dry Press Brick Plant. Plenty of shale, and good market for all the brick. Address
DENIS, care Clay Record,
Chicago, Ill.

FIRE CLAY LANDS.

500 acres underlaid with heavy vein superior fire clay and light vein coal, which can be mined cheaply, on the line of the N. Y. C. & H. R. R. R., in Pennsylvania, for lease on royalty at low price per ton. For further information address the owner.
BOX No. 308, Williamsport, Pa.

OPPORTUNITY FOR PRACTICAL MAN

An opportunity for a practical man that can invest some money to take a position as yard foreman. Address

YARD FOREMAN
Care Clay Record, Chicago, Ill.

STEAM SHOVEL FOR SALE.

Barnhart style "B," good condition, large enough to dig clay for 100,000 brick in 8 hours. Apply to
ILLINOIS BRICK COMPANY,
918 Chamber of Commerce,
Chicago.

FOR SALE.

One 5-ft. Style American Dry Pan, practically new. One 10-hp. Gasoline Engine, complete.
KIAMENSI CLAY CO.
Newport, Del

BRICK PLANT WANTED

Wanted to buy or lease a brick yard for making red brick.

RED BRICK
169 Division Street, New Haven, Ct.

SAND LIME PLANT.

Huennekes System Plant, including best Four-Mould Boyd Press, Jeffrey Sand Dryer and Conveyor; all practically new and in good condition; will be sold at less than half of construction cost. Address, SAGINAW PRESSED BRICK CO.
Saginaw, Mich.

FRANK TOOMEY

127 and 131 North Third Street.
PHILADELPHIA, PA.

Great

Assortment.

3,200

Pieces.

ENGINES,

CORLISS.

Automatic.

Steam

Slide Valve,

Pumps,

Dynamos,

General

Machinery of

all kinds

Rebuilt and

Guaranteed.

Immediate

Delivery.

Send for

List of Stock

Brick and Mortar Coloring

After twenty years "Clinton" colors still stand at the head. Get the genuine, with the "Little Yellow Side-Label."

CLINTON METALLIC PAINT CO., Clinton, N. Y.
CORRESPONDENCE SOLICITED.

WARNING

NOTICE is hereby given that the process of drying and burning brick by first setting green, undried brick in horizontal courses in a kiln to form a layer thereof, then covering and drying such layer, and successively coursing, capping and drying separate layers of green, undried brick upon the last dried layer until all the layers are thoroughly dried, and then burning, is patented in U. S. Letter Patent No. 485199 to J. C. Kenzel, dated Nov. 1, 1-92, and all persons are hereby warned against using such processes without grant or license from the undersigned owners of said patent. Unauthorized use of the patented process will render the user liable to an action for infringement and the payment of damages to the owners of the patent, whose rights thereunder will be strictly enforced.

J. C. KENZEL,
J. S. KRAUSS,

P. O. Box 271.

128 Logan St., Knoxville, Tenn.

The Burlington Route

calls attention to manufacturers seeking a new location to its Industrial Department. This department is established for the benefit of manufacturers. Information on the three Rs of manufacturing—Power, Raw Material, Market—can be had by writing

**W. H. MANSS,**

Industrial Commissioner,

209 Adams St., CHICAGO.

CLAY RECORD IS A SEMI-MONTHLY

NOW READY—A TREATISE ON

PRODUCER-GAS and GAS-PRODUCERS

BY AN ACKNOWLEDGED AUTHORITY.

A 300-page book containing thirty chapters, giving the fundamental principles and definitions, calculations, classifications, manufacture and use; the fuel, the requirements, the history, its by-products, **Producer-Gas** for firing kilns, steam boilers, and power plants. The future of the Gas-producer and a bibliography.

OVER 100 CHOICE ILLUSTRATIONS—PRICE, \$4.00.

A subscription to the CLAY RECORD for one year without additional charge to those that are not now subscribers.

CLAY RECORD PUBLISHING COMPANY

CHICAGO, ILL.

Refractory Cement

(So called because it is worked the same as cement)

A high refractory composition that can be used the same as cement, cured and put to use in twelve to twenty-four hours, and will endure any degree of heat that fire-clay products will.

Applied to the inside of a kiln it will protect the walls and give increased refractivity; will reduce the cost of repair, and save fuel in any kiln.

Every boiler furnace should be lined inside with "Refractory Concrete." It will protect the walls and increase the heating capacity by preventing radiation.

For insulating steam pipes this composition is guaranteed equal to asbestos or magnesia felt; the cost per foot to cover a 3-inch to the thickness of 1 inch will be 4c.

Refractory brick of a high order can be formed from the composition on any cement brick machine.

For flue linings, chimney blocks and tops, floor and partition blocks, conduits for electric wires, etc., this is the ideal material.

Refractory Concrete can be combined with any aggregate used in the formation of cement products.

For information pertaining to your particular requirement, and prices, address.

E. R. STOWELL

NEW CORYDON, INDIANA

**A NEW CLAY FEEDER AND MIXER**

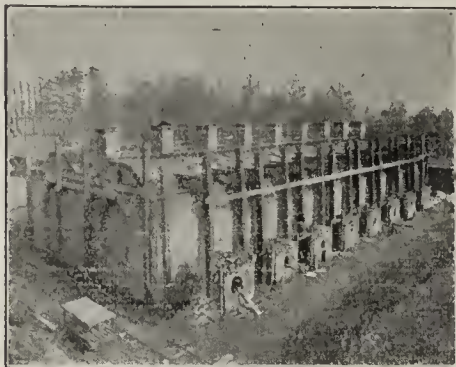
The Rust Clay Feeder has been brought out in response to a better method for mixing and feeding clay in brick, tile and all clay working plants. By the use of this feeder the services of two men are entirely dispensed with, the clay being dumped into hopper of machine from car is automatically fed into the disintegrator. The spirals draw their supply evenly from all parts of the hopper, mixing the clay perfectly, which tends both to improve and increase the output of the plant.

Send for full descriptive circular

Marion Machine, Foundry and Supply Co.

Marion, Ind.

Something New In Brick Kilns and Dryers



The Dennis Double Chamber Up and Down Draft Brick Kilns and Direct Heat and Hot Air Brick Dryers show many new features that make them superior to all others. Economical, durable and strong in construction and operation, having many points of advantage that appeal to practical brick-makers. Patented April 14, 1903 and September 8, 1903. Brick plants installed and put in operation. Write for booklet. Correspondence solicited.

F. W. DENNIS,
145 Water St., Norfolk, Va.



Absolutely safe and reliable. Ask your friends

A WOODEN TOWER

Is a source of annoyance and danger. It is liable to rot and collapse at any time. A

CALDWELL STEEL TOWER

is safe, staunch and durable and will carry four times the weight of the filled tank. Expensive labor is not necessary to erect these outfits, your own men can do it. We furnish all plans.

Send for illustrated catalogue and price list.

W. E. CALDWELL CO., - Louisville, Ky.

Robert F. Wentz, M. W. S. E.

701 National Bank Building, Allentown, Pa.

DESIGNER AND BUILDER OF

Cement and Sand-Lime Brick Plants, Analysis, Tests, Examinations, Reports, Preliminary Plans, Estimates and Complete Drawings and Specifications for Modern Cement and Sand-Lime Brick Works.

We have designed, built and reconstructed twenty-two Cement Plants in the past twenty years.

We design and equip complete Cement and Sand-Lime Brick Plants with the most modern machinery.

THE HYDRO - MALAXATOR PROCESS for the manufacture of Sand-Lime Brick.

How to Use Portland Cement.

From the German of L. Golinelli.

Translated by Spencer B. Newberry, E. M., Ph. D.

A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.

22,000 copies sold in Germany.

Portland Cement Sidewalk Construction.

Compiled by P. B. Beery, and based upon the experience of many successful contractors.

A booklet of 30 pages, 5½x6½ inches.

PRICE, 50 CENTS.



FIRE! FIRE!! FIRE!!!

THE "CHILDS"
FIRE EXTINGUISHERS
APPROVED

and included in the list of approved extinguishers issued by the

National Fire Protection Association

SALESMEN WANTED

O. J. CHILDS CO.

Sole Mfrs.

UTICA, N. Y.

Brick Moulds and Brick Barrows

With Moulds and Barrows it is not the first cost, but it is, will they last? We have made them for over 30 years and know your wants. All kinds and shapes. A trial order will convince.

James B. Crowell & Son,
Walkill, N. Y.

PERFECTION BRICK MOULDS



PATENTED JAN. 28, 1902.

THE ARNOLD-GREAGER CO.

Manufacturers of Brick Machinery
and Supplies of all Kinds.

NEW LONDON, OHIO.

These are the kind of Brick Moulds the Brick Makers have always wanted but could not get till now. You can get a mould that the vents are right all the time. No change whether the Mould is wet or dry. Try a sample order. Satisfaction guaranteed.

H. M. DEAVITT,

PRACTICAL AND CONSULTING CHEMIST,
Garden City Block,
CHICAGO.

Analyses of Clay, Sand, Lime, Cement Materials and Shales a specialty.

Special attention given to the preparation of Clay Products from the raw material.

A well equipped laboratory and long experience in this branch of work enables us to give expert reports on obtaining glazes on refractory materials.

All enquiries in regard to the above will receive prompt attention.





UNIVERSITY OF ILLINOIS-URBANA



3 0112 004912215